CUTTING PRO
FC4100 SERIES

USER'S MANUAL

GRAPHTEC

Thank you for choosing an FC4100 Cutting Plotter Series.

The FC4100 is a high-performance grit-rolling cutting plotter that incorporates a 16-bit CPU and digital servo drive system for highly precise cutting of color adhesive film at high speed.

The FC4100 Series;

FC4100-75	30 inches (75 cm) wide.
FC4100-100	42 inches (100 cm) wide.
FC4100-130	54 inches (130cm) wide.

For more information about Graphtec and Graphtec products, visit Graphtec's home pages at:

www.graphtecusa.com (USA, Canada, South America)

www.graphteccorp.com (Other regions)

For frequently asked questions, visit our FAQ site for the FC4100 at:

www.graphtecusa.com/imaging/cutters/fc4100/faq.htm

TABLE OF CONTENTS

Special precautions ..... SP - 1
- Handling the Cutting Blades ..... SP - 2
- Handling the Cutters ..... SP - 2
- Attaching a Cutter Pen ..... SP - 3
- After turning on the Plotter ..... SP - 4
- Machine caution Label ..... SP - 5
- Notes on Working Environment ..... SP - 6
- Notes on Use ..... SP - 7
- Daily Maintenance ..... SP - 8
- Storing the Plotter ..... SP - 8

Chapter 1 Out of the Box ..... C1 - 1
- Checking the Contents ..... C1 - 1
  - Accessories ..... C1 - 1
- Nomenclature ..... C1 - 2
- Installing the Accuload System ..... C1 - 3
- Connecting the Plotter ..... C1 - 5
  - Connecting to the Computer ..... C1 - 5
  - Connecting to the Power ..... C1 - 6
  - Power to the Plotter ..... C1 - 7

Chapter 2 Cutters and Holders ..... C2 - 1
- Cutter Pen Nomenclature ..... C2 - 2
  - PHP32-CB09N Cutter Pen ..... C2 - 2
  - PHP32-CB15N Cutter Pen ..... C2 - 2
  - PHP31-CB15 Cutter Pen ..... C2 - 2
  - PHP32-CB09 Cutter Pen ..... C2 - 3
  - PHP32-CB15 Cutter Pen ..... C2 - 3
- Replacing the Cutter Blade ..... C2 - 4
  - Replacing Supersteel Blades in the PHP32-CB09(N) & PHP32-CB15(N) ..... C2 - 4
  - Replacing Ceramic & Sapphire Blades in the PHP31-CB15 ..... C2 - 5
- Blade Length ..... C2 - 6
  - Adjusting the Blade Length ..... C2 - 6
  - Obtaining the Correct Blade Length ..... C2 - 6

Chapter 3 Preparing to Cut ..... C3 - 1
- Control Panel ..... C3 - 1
- Indicator Lamps ..... C3 - 1
- Select Keys ..... C3 - 1
- Position Keys ..... C3 - 2
- Menu Keys ..... C3 - 2
- Selecting a Function Menu ..... C3 - 4
- Initial Menu ..... C3 - 4
- Setting the Multilanguage Display ..... C3 - 5
- Turn on the Plotter ..... C3 - 6
- Loading Media ..... C3 - 7
  - Sheet Media ..... C3 - 7
  - Roll Media ..... C3 - 12

Select the Media Type ..... C3 - 18
ROLL-1 ..... C3 - 18
ROLL-2 ..... C3 - 18
SHEET ..... C3 - 19
CONTINUE ..... C3 - 19
Initializing Routine ..... C3 - 20
ROLL-1 ..... C3 - 20
ROLL-2 ..... C3 - 20
SHEET ..... C3 - 20
CONTINUE ..... C3 - 20
Setting Conditions ..... C3 - 21
Select the Tool from the Menu ..... C3 - 21
TANGENTIAL mode ..... C3 - 22
Cutter Conditions ..... C3 - 23
To Change the Cutter Force ..... C3 - 23
To Change the Cutter Speed ..... C3 - 23
To Change the Cutter Quality ..... C3 - 24
To Change the Cutter Offset ..... C3 - 24
Running Cutting Test ..... C3 - 25
Test 1 ..... C3 - 26
Test 2 ..... C3 - 26
Cutting Pro ..... C3 - 27
Plotter Pen Conditions ..... C3 - 28
Pen reference Values ..... C3 - 28
To Change the Pen Force ..... C3 - 28
To Change the Pen Speed ..... C3 - 29
To Change the Pen Quality ..... C3 - 29
Pounce Conditions ..... C3 - 30
To Change the Pounce Force ..... C3 - 30
To Change the Pounce Speed ..... C3 - 30
To Change the Pounce Quality ..... C3 - 31
To Change the Pounce Offset ..... C3 - 31
Light Pointer Conditions ..... C3 - 32
How to Pint the Target ..... C3 - 32
Checking the Cutter Path ..... C3 - 30
Changing Feed Speed ..... C3 - 33
Withdrawal of the Pen Carriage ..... C3 - 34
Returning the Pen Carriage to Origin ..... C3 - 34

Chapter 4 Advanced Functions and Settings ..... C4 - 1
ORIGIN - Setting the Cutting Origin ..... C4 - 2
Origin Point with ROTATE function ..... C4 - 2
COPY - Copying the Data in Plotter Buffer Memory ..... C4 - 3
Copying Sequence ..... C4 - 5
PEN UP/DOWN - Raising/Lowering the Pen ..... C4 - 6
BUFFER CLEAR - Clearing the Buffer ..... C4 - 7
FEED - Advancing the Media ..... C4 - 8
ORIGIN - Setting the Origin in HP-GL™ Mode ..... C4 - 9
AREA - Setting the Cutter Area ..... C4 - 10
EXPAND - Expanding the Cut Area ..... C4 - 13

PAGE LENGTH - Setting the Length of the Page with Roll Media ..... C4 - 16
ROTATE - Rotating the Coordinate Axes ..... C4 - 17
DATA SORTING - Sorting the cut data ..... C4 - 18
MIRROR - Reversing the Image ..... C4 - 20
SCALE - Enlarging and Reducing an Image Size ..... C4 - 21
AXIS ALIGNMENT - Axis Alignment Parameter Setting ..... C4 - 22
Selecting the Axis Alignment Tool ..... C4 - 23
Selecting the Axis Alignment Method ..... C4 - 24
Axis Alignment Adjustment ..... C4 - 26
AUTO PRE FEED - Advancing the Media Automatically ..... C4 - 28
TANGENTIAL EMULATION - Cutting Tiny Letters or Thick & Thin Material ..... C4 - 30
Selecting Tangential Emulation Mode ..... C4 - 30
Enabling the Tangential Emulation ..... C4 - 31
SPEED - Setting the Pen Up Speed ..... C4 - 32
OFFSET ANGLE - Adjusting the Blade Offset Angle ..... C4 - 33
OFFSET FORCE - Setting the Offset Cut Pressure ..... C4 - 34
STEP PASS - Setting the Step Pass ..... C4 - 35
DISTANCE ADJUST - Adjusting the Length of Cut Line Segments ..... C4 - 36

Chapter 5 Background Settings ..... C5 - 1
The MENU TREE of Background Setting ..... C5 - 2
Background Settings for GP-GL ..... C5 - 3
LANGUAGE SELECTION ..... C5 - 3
“:” “;” Command Control (“:” “;” COMMAND) ..... C5 - 3
Pen UP/DOWN for the “W” Command ..... C5 - 4
Condition Priority ..... C5 - 4
Initial Blade Control Position (INIT. BALDE CONTROL) ..... C5 - 5
Length Unit ..... C5 - 5
Pen UP Movement Control (PEN UP MOVE) ..... C5 - 6
Media Size Sensor Control ..... C5 - 6
Pinch Roller Sensor Control ..... C5 - 7
Background Settings for HP-GL ..... C5 - 8
LANGUAGE SELECTION ..... C5 - 8
Model No. Response (MODEL EMULATED) ..... C5 - 8
Condition Priority ..... C5 - 9
Initial Blade Control Position (INIT. BLADE CONTROL) ..... C5 - 9
Length Unit ..... C5 - 10
Pen UP Movement Control (PEN UP MOVE) ..... C5 - 10
Media Size Sensor Control ..... C5 - 11
Pinch roller Sensor Control ..... C5 - 11
Circle Resolution ..... C5 - 12

Chapter 6 Test Modes and Troubleshooting ..... C6 - 1
CONDITION LIST - Listing the Cutter Conditions ..... C6 - 1
Sample printout of the CONDITION function ..... C6 - 2
DATA DUMP - Using the Character Dump Mode ..... C6 - 3
SELF TEST - Running the Self Test ..... C6 - 5
Troubleshooting - The Plotter is Turned on but it Doesn’t Work ..... C6 - 7
Troubleshooting - Improper Initialization ..... C6 - 8
Troubleshooting - Plotter does not Operate Properly ..... C6 - 9

Troubleshooting - Poor Cutting Results ..... C6 - 12
Error Messages and Their Cause ..... C6 - 16
Error Messages with their Possible Causes and Probable Solution ..... C6 - 16
Command Error Messages and Their Causes ..... C6 - 18
Error Messages in GP-GL Command Mode ..... C6 - 18
Error Messages in HP-GL Command Mode ..... C6 - 20

Chapter 7 Setting The Interface Function ..... C7 - 1
Setting the Parallel Interface ..... C7 - 1
Setting the Serial Interface ..... C7 - 1
INTERFACE - Setting the Interface Function ..... C7 - 2
How to get to the INTERFACE menu before you have loaded media ..... C7 - 2
How to get to the INTERFACE menu after you have loaded media ..... C7 - 2
STEP SIZE - Setting the Programmable Resolution ..... C7 - 3
RS-232C - Setting the Data Transmitting Conditions ..... C7 - 4
COMMAND - Selecting the Command Mode ..... C7 - 5
Centronics-Compatible Parallel Interface ..... C7 - 6
Specifications ..... C7 - 6
Electrical Characteristics ..... C7 - 6
Input/Output Circuitry ..... C7 - 7
Input/Output Timing Chart ..... C7 - 7
Pin Assignment of the Parallel Connector ..... C7 - 8
RS-232C Serial Interface ..... C7 - 9
Specifications ..... C7 - 9
Electrical Characteristics ..... C7 - 9
Pin Assignment of the Serial Connector ..... C7 - 10
Cable Connection ..... C7 - 10

Chapter 8 Specifications ..... C8 - 1
Main Specifications: FC4100-75 ..... C8 - 1
Main Specifications: FC4100-100 ..... C8 - 2
Main Specifications: FC4100-130 ..... C8 - 3
Options ..... C8 - 4
External Dimensions: FC4100-75 ..... C8 - 5
External Dimensions: FC4100-100 ..... C8 - 6
External Dimensions: FC4100-130 ..... C8 - 7

Chapter 9 Options ..... C9 - 1
FC4100 Pounce Tool Manual ..... C9 - 1
Inserting the Pounce Tool ..... C9 - 2
Select Pounce Tool from the Menu ..... C9 - 3
Pounce Conditions ..... C9 - 3
To Change the Pounce Force ..... C9 - 3
To Change the Pounce Speed ..... C9 - 3
To Change the Pounce Quality ..... C9 - 3
To Change the Pounce Offset ..... C9 - 3
FC4100 Stand Option ..... C9 - 4
Contents ..... C9 - 4
Assemble the Stand ..... C9 - 5
FC4100 Basket Option ..... C9 - 7

Contents ..... C9 - 7
Assemble the Basket ..... C9 - 8
FC4100 Media Roll Holder Option ..... C9 - 12
Contents ..... C9 - 13
Assemble the Media Holders ..... C9 - 13

Appendix ..... AP - 1
Information to the User ..... AP - 1
Compliance Information Statement ..... AP - 1
EC Declaration of Conformity ..... AP - 2

Index ..... ID - 1

Special Precautions

This section covers special precautions you should take when operating or storing your plotter.

TIP: Information to simplify the task.

NOTE: Important information to complete a task correctly.

CAUTION: Will cause damage to the unit.

ACHTUNG: Lesen Sie den mit diesem Symbol markierten Absatz besonders aufmerksam. Es besteht die Gefahr eines irreparablen Schadens, sofern nicht genau nach den Anweisungen vorgegangen wird und diese korrekt durchgefürhrt werden.

WARNING: Will cause damage to the Operator.

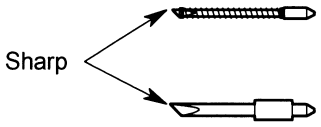
WARNUNG: Es besteht Verletzungsgefahr.

Handling the Cutting Blades

WARNING: Cutter blades are used with this plotter. Be sure to handle the cutter blades and holders with care to prevent bodily injury.

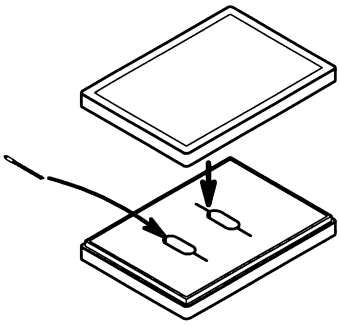
WARNUNG: Benutzen Sie diese Messer vorsichtig, um Verletzungen zu vermeiden.

- Cutter blades are very sharp. While handling a cutter blade or cutter pen, be careful to avoid cutting your fingers or other parts of your body.



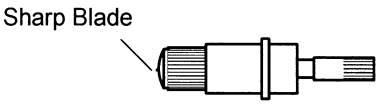
- Die Messereinsätze sind sehr scharf! Um Verletzungen vorzubengen, müssen die Messereinsätze mit vorsicht gehandhabt werden.

- Promptly return used blades to the cutter case provided. When the case is completely filled, discard the used blades together with the case.



Handling the Cutters

- The tip consists of a sharp blade so make sure not to extend it too far.



- Instructions on replacing the blade or adjusting the blade length are provided in ***Cutters and Holders.***

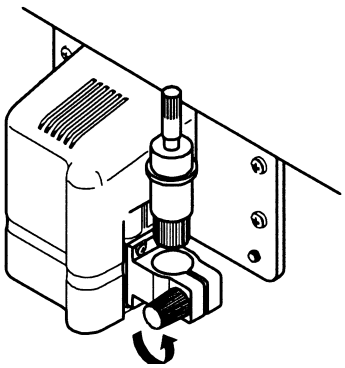
Attaching a Cutter Pen

WARNING: To avoid injury, do not touch the pen tip after the plotter is turned on.

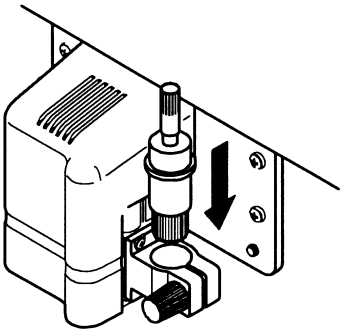
WARNUNG: Um das Risiko einer Verletzung herabzusetzen, sollten Sie niemals das messer berühren während der Schneidplotter arbeitet.

Follow the procedure below to attach a cutter pen to the pen carriage

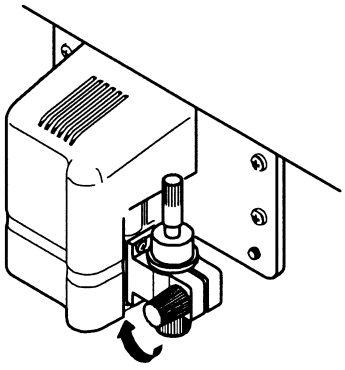
1. Make sure the pen holder screw is loose.



2. While holding the pen holder upward, push the cutter pen all the way into the holder until its rim contacts the pen stopper.



3. When the pen as been properly mounted, tighten the screw.



After Turning on the Plotter

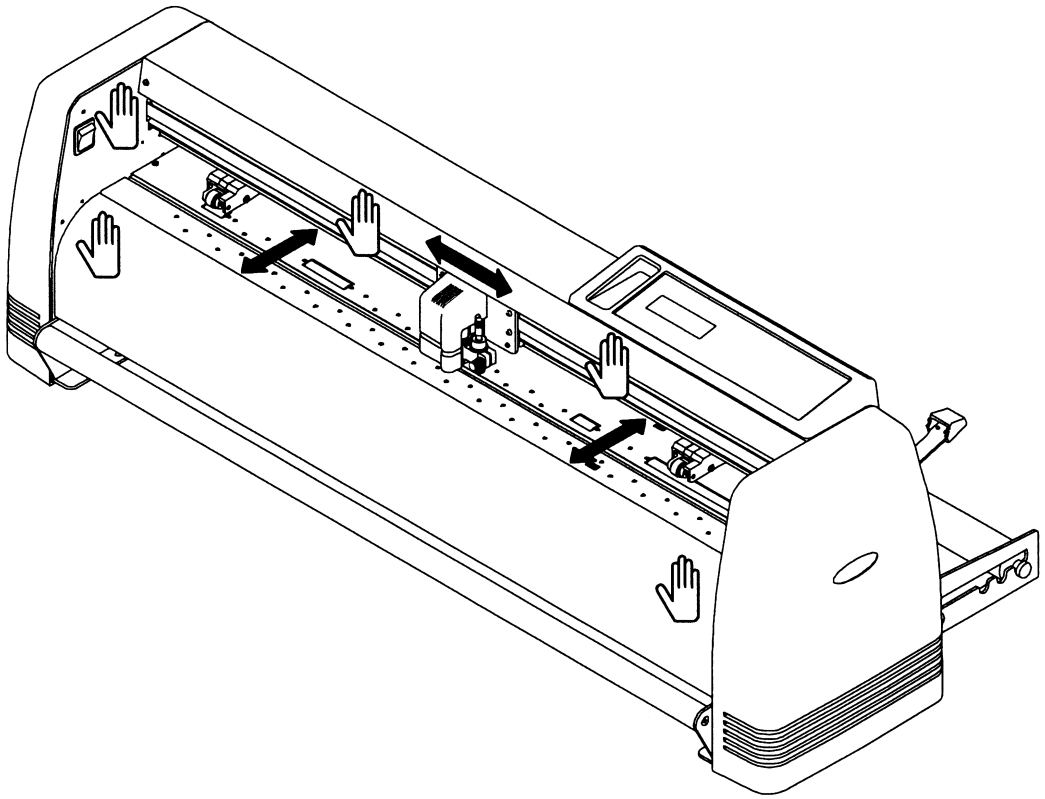
During the course of turning on the plotter, be sure to observe the following precautions:

The pen carriage and loaded media may suddenly move during the cutting operation, immediately afterward and when setting the plotter's functions.

Keep your hands, hair, clothing and other objects out of the vicinity of the pen carriage, grit rollers and loaded media.

To prevent operator injury and poor cutting results, be careful not to allow your hands, hair, clothing or other foreign objects to become entangled with the pen carriage or loaded media while using the plotter.

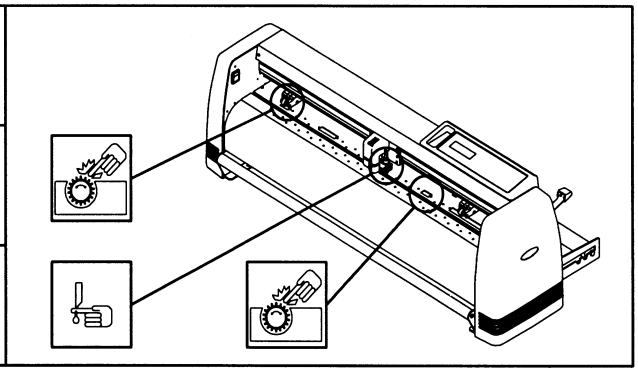
Um das Risiko einer Verletzung herabzusetzen, Halten Sie Hände, Haare und Kleidung fern von bewegten Teilen! Legen Sie nicht die Hände oder Gegenstände auf oder neben die bewegten Teilen!



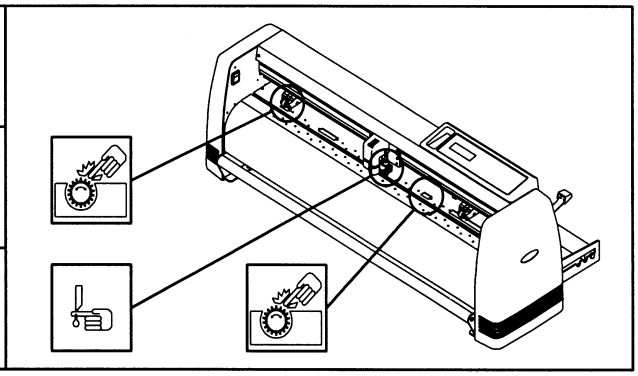
Machine Caution Label

The Machine's Caution Label is located on the top cover.

	CAUTION. REFER TO USER'S MANUAL BEFORE OPERATION
	SHARP POINT
	KEEP HANDS, HAIR, AND CLOTHES AWAY FROM MOVING PARTS



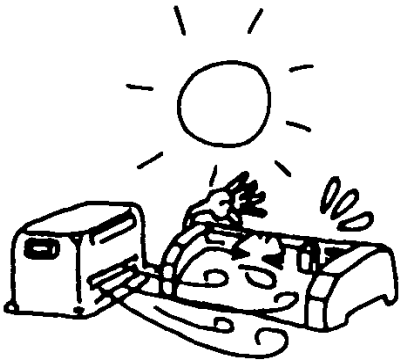
	Achtung. Für weitere Informationen, lesen Sie bitte diese Handbuch, bevor Sie mit der Arbeit beginnen.
	Scharfe Kante.
	Halten Sie Hände, Haare und Kleidung fer von bewegten Teilen!



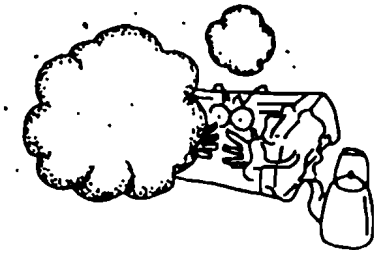
Notes on Working Environment

Be sure to observe the following notes in the working environment of your plotter:

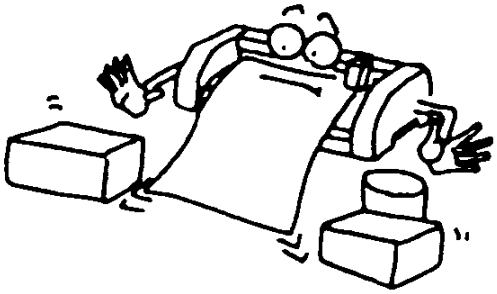
- Avoid use or storage of the plotter in places subject to direct sunlight or the direct draft from air-conditioning.



- Avoid locations that are extremely dusty.



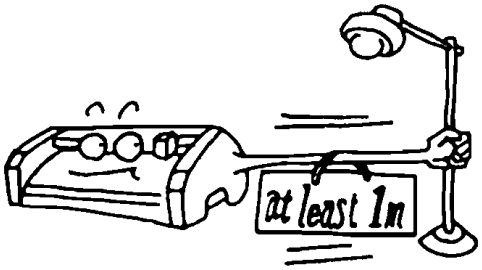
- Prior to cutting, ensure that no obstacles are placed in the vicinity of the pen carriage or loaded media.



CAUTION: Impeded movement of the pen carriage or loaded media may prevent accurate cutting, or may trigger the position alarm to reset the system or system overload. An overloaded system triggers the product's circuit protection.

Should the system overload, causing the power to shut down, turn off the power switch and unplug the power cord. After 5 to 10 minutes, connect the power and turn on the system. For more information, see ***Chapter 6 Test Modes and Troubleshooting***.

- To prevent malfunctions of the plotter's sensors, position the plotter at least one meter (3 feet) away from fluorescent lamps, electric lamps and any other source of indoor illumination.

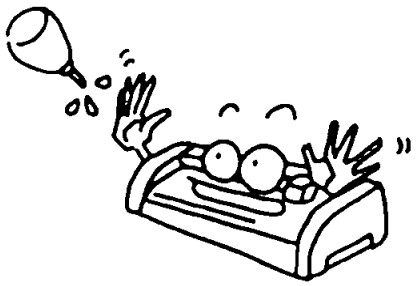


Notes on Use

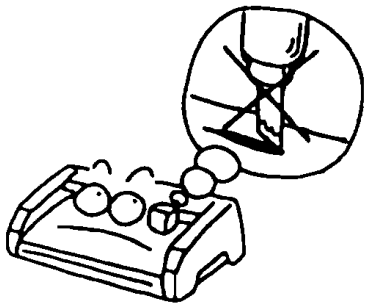
Be sure to observe the following notes on the use of your plotter:

CAUTION: Make sure your computer and power sources are adequately grounded (the RS-232 interface cable should meet the CCITT V24, EIA RS-232 standards. Graphtec's RS-232 serial interface cable conforms to the EIA standard). Inadequate grounding may result in severe damage to your plotter or computer and constitute misuse of the plotter.

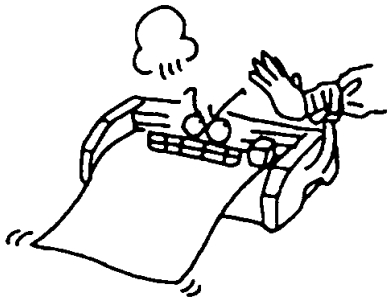
- Never lubricate the plotter mechanisms, it will result in plotter malfunction



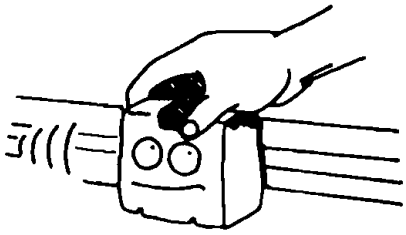
- To avoid scratching the cutting mat, ensure that the cutter pen blade is not excessively extended.



- Do not touch the moving parts of the plotter while it is operating.



- When manually moving the pen carriage to load the media be sure to move the pen carriage slowly.



Daily Maintenance

During the course of daily plotter operation, be sure to observe the following precautions:

- Never lubricate the mechanisms of the plotter.
- Clean the plotter's casing using a dry cloth that has been moistened in a neutral detergent diluted with water. Never use thinner, benzene, alcohol, or similar solvents to clean the casings; they will damage the casing's finish.
- Clean the cutting mat using a dry cloth. In case of stubborn stains, use a cloth that has been moistened in alcohol or in a neutral detergent diluted with water.
- Clean the plotter's paper sensors using a cloth moistened in a neutral detergent diluted with water. Never use thinner, benzene, alcohol, or similar solvents to clean the sensors; they will damage the sensors.

Storing the Plotter

When your plotter is not being used, be sure to observe the following points:

- Remove the pen attached to the penholder.
- Cover the plotter with a cloth to protect it from dust and dirt.
- Do not store the plotter in direct sunlight or high temperature.

Chapter 1 Out of the Box

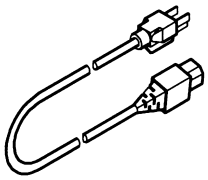
This chapter describes plotter nomenclature and how to install your plotter.

Checking the Contents

After unpacking your plotter, check that the standard accessories shown below are all present. If any accessory is missing, contact your sales representative or the nearest Graphtec dealer.

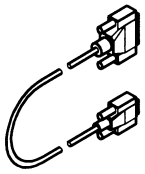
Accessories

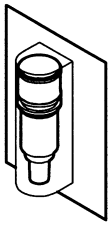
Power Cord
(The configuration pictured may differ from the actual cords supplied.)



Cutter Pen Set
Cutter Holder
(PHP32-CB09N)
with 2 cutter blades
(CB09UA)

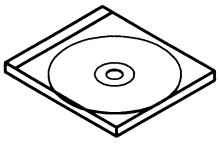
RS-232 Cable
w/adapter
(US Market only)





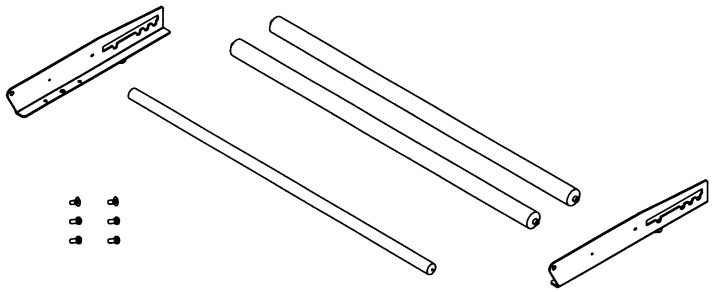
Black Water-Based
fiber-tip pen
KF552-BK-P

User's Manual



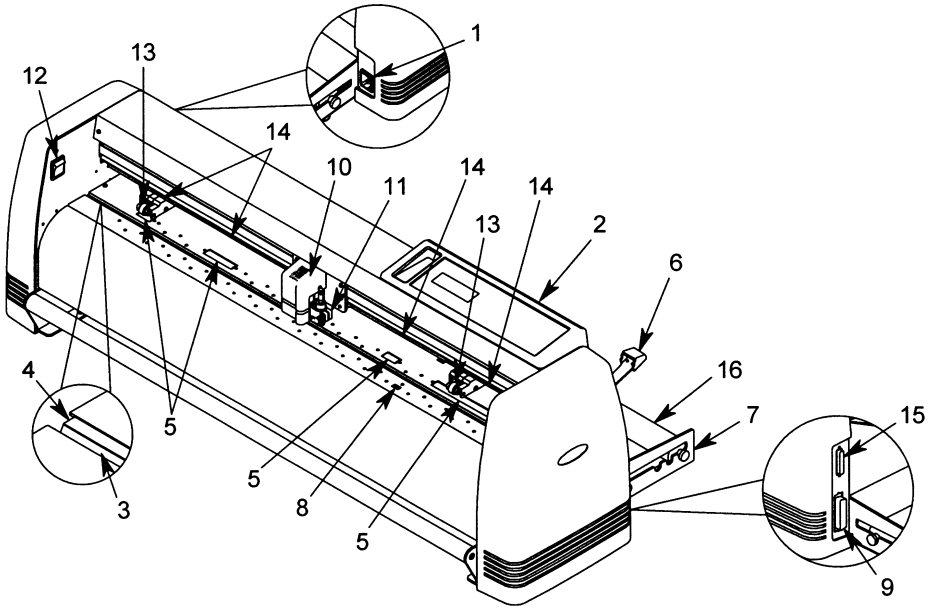
Stand Kit
(FC4100-75 Option)
(FC4100-100 Standard)
(FC4100-130 Standard)

Accuload™



Nomenclature

1. **AC Line Inlet:** Where the power cord is connected.
2. **Control Panel:** Used to access various plotter functions.
3. **Cutting Channel:** A channel running along the cutting mat area. Used to reduce pouncing tool wear.
4. **Cutting Mat:** A black strip placed under the cutting area. Used to reduce cutting blade wear.
5. **Grit Rollers:** Metallic rollers which have a file like surface.
6. **Media Set Lever:** Used to raise or lower the push rollers during loading or unloading media.
7. **Accuload™:** Used to carry rolled media and ensure its rotation.
8. **Paper Sensor:** The front is used to sense the leading edge of the media. The rear sensor is used to sense the trailing edge of the media.
9. **Parallel Interface Connector:** Used to connect the plotter to the computer with a Centronics compatible parallel interface cable.
10. **Pen Carriage:** Moves the pen across the media during cutting or plotting.
11. **Pen Holder:** Holds the pen onto the pen carriage.
12. **Power Switch:** Used to turn the plotter on and off.
13. **Push Rollers:** Black rubber rollers that push the media against the grit rollers.
14. **Roller Location Guide:** Yellow markings on the rail and rear side of the top cover that show the position of each grit roller. Use these guides as an aid in locating the push rollers and in locating the media roll on the stock roller.
15. **Serial Interface Connector:** Used to connect the plotter to the computer with a RS-232 serial interface cable.
16. **Stock Rollers:** Part of the media stocker. Where the media is mounted.



Installing the Accuload System

The Accuload system consists of two media brackets, two stock rollers and one media alignment bar.

Installation procedure

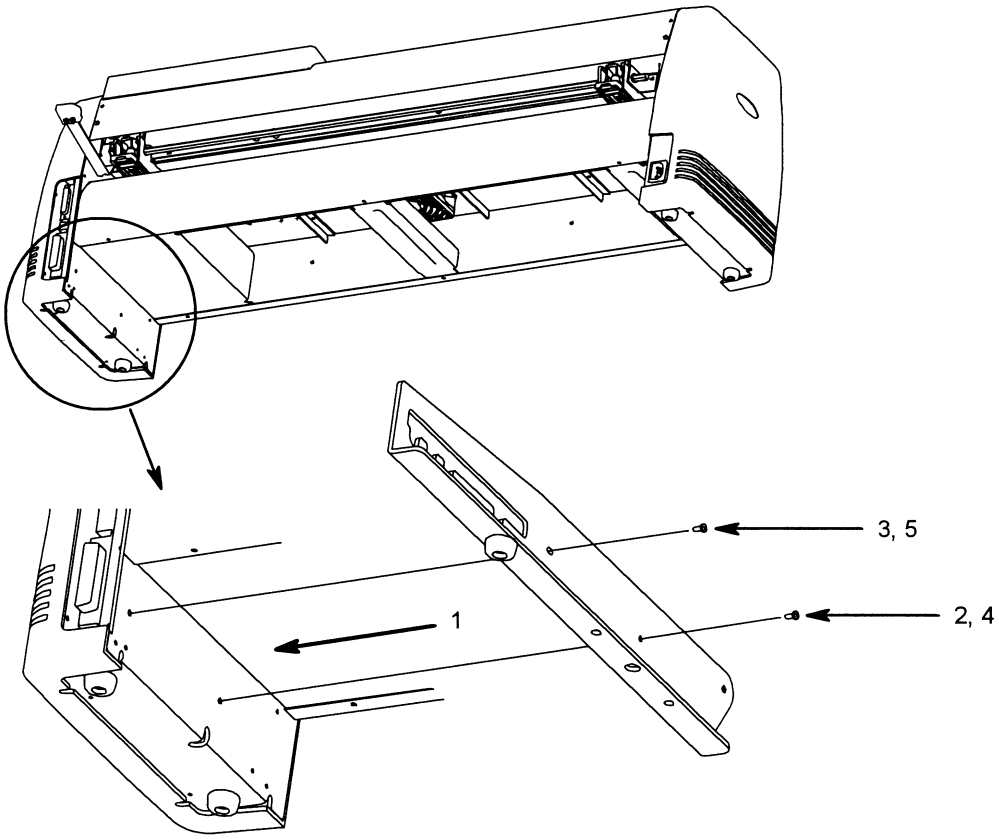
1. Place the media bracket (right) against the inside surface of the plotter's side box (right).
2. Insert an M4 screw at the second hole from the front side of the plotter.

NOTE: Do not over tighten so that the bracket can rotate easily.

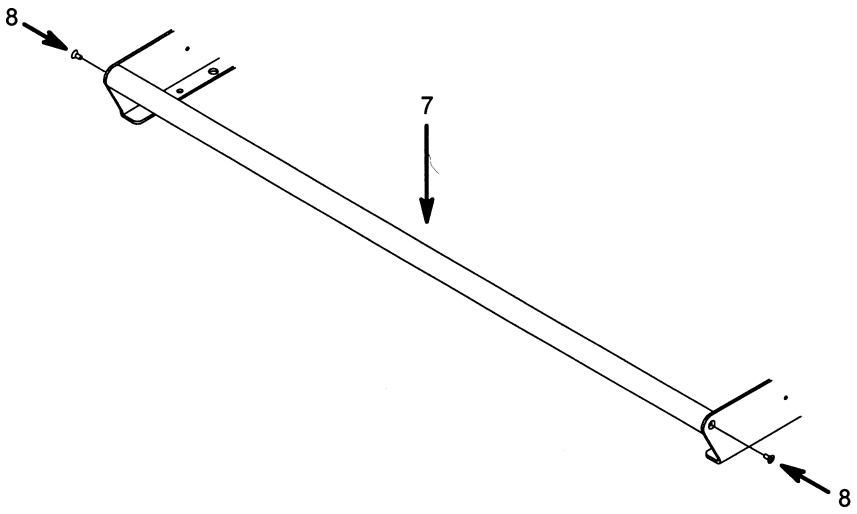
ASSEMBLY TIP: When attaching the bracket on to the cutter, use the foam shipping cover to protect the cutter.

CAUTION: Do not lay the cutter on it's back side, it may damage the Media Set Lever.

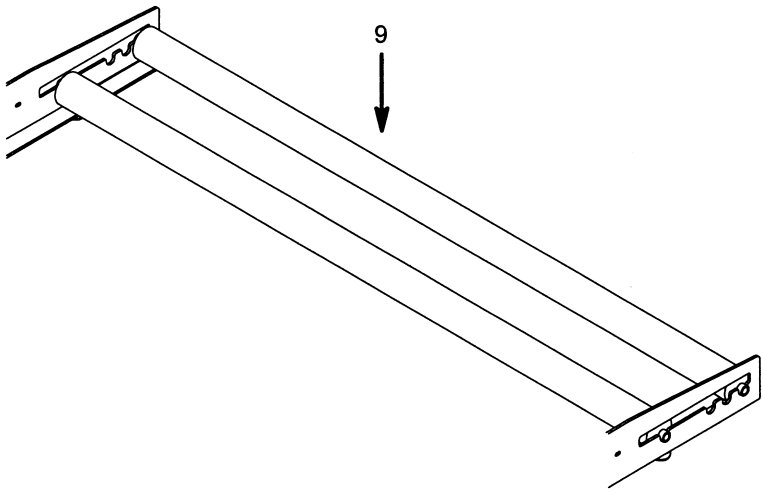
3. Insert an M4 screw at the third hole from the front side of the plotter.
4. Secure the first screw.
5. Secure the second screw.
6. Repeat steps 1-5 with the Media Bracket (left).



7. Place the media alignment bar in between the tabs of the media brackets that protrude from the front side from the plotter.
8. Secure the media alignment bar to the tabs at both ends with M4 flat head screws.



9. Install stock rollers into the holes on the rear side of the media brackets.



NOTE: Be sure to tighten all the screws to ensure accurate media loading. The Accuload™ system may not function properly if even one of the screws are loose.

NOTE: Be sure to place the plotter on a work surface that will accept a plotter.
FC4100-75: 42 inches (106cm) wide by 19 inches (48cm) deep.
FC4100-100: 55 inches (140cm) wide by 19 inches (48cm) deep.
FC4100-130: 67 inches (170cm) wide by 19 inches (48cm) deep.

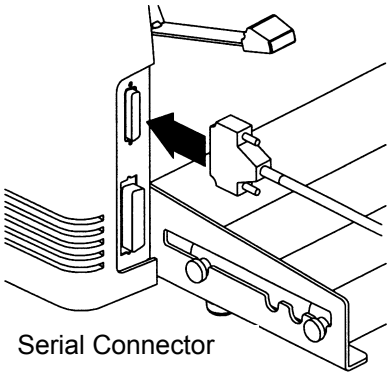
Connecting the Plotter

Connecting to the Computer

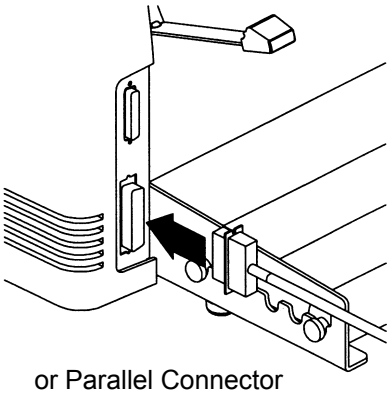
The FC4100 Plotter is equipped with an RS-232 or Serial Interface Cable in the Accessory Kit.

1. Connect the 25 pin connector to the RS232-C connector on the plotter and tighten the screws. If you are using a Centronics compatible parallel interface cable connect the 36 pin connector to the Parallel connector on the plotter and lock the levers.

2. Connect the 9 pin connector to the connector on the computer COM port and tighten the screws. If your computer has a 25 pin connector port, use the 9 pin to 25 pin adapter that is supplied in the accessory kit.



Serial Connector

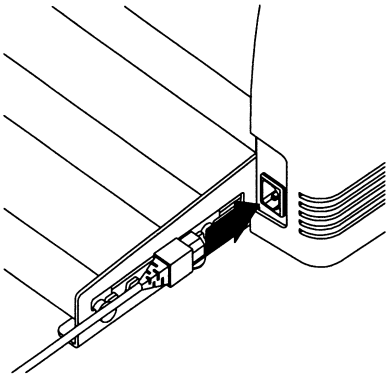


or Parallel Connector

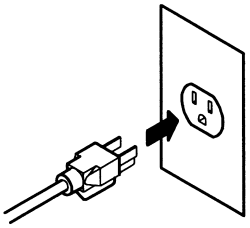
Connecting to the Power

The FC4100 Plotter is equipped with a Power Cord in the Accessory Kit.

1. Connect power cord to the plotter.



2. Connect one end of the power cord provided to an electrical socket of the rated supply voltage then connect the other end to the plotter's AC line inlet.



Power to the Plotter

To turn on the plotter, perform the following steps:

1. Make sure that the plotter is turned off (the “O” side of the POWER switch is depressed).

2. Connect the plotter to a computer and then configure your software application to the desired interface conditions (if the RS-232C serial interface is used), command mode and programmable resolution.

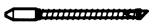
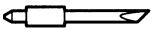
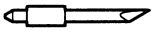
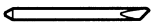
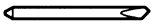
3. Connect one end of the power cord provided to an electrical socket of the rated supply voltage then connect the other end to the plotter’s AC line inlet. The plotter’s power supply accepts multi-voltage (100VAC to 240VAC) without changing switches.

4. Turn on the computer.

5. Turn on the plotter (the “I” side of the POWER switch is depressed).

Chapter 2 Cutters and Holders

This chapter describes the different cutters and their uses.

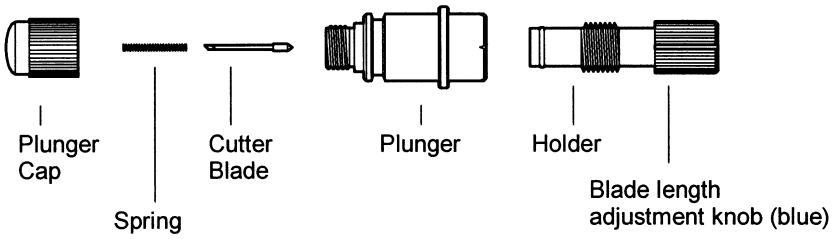
Blade part no. and type	Diameter and blade offset value	Plunger part no.	Applications and features
CB09UA (supersteel) 	ϕ 0.9 mm 0.45	PHP32-CB09N or PHP32-CB09	Standard blade for cutting color adhesive media. Suitable for cutting media up to 0.25 mm thick. Maximum cutting distance of approximately 4000 m.
CB15U (supersteel) 	ϕ 1.5 mm 0.75	PHP32-CB15N or PHP32-CB15	For cutting media which is too thick for the CB09UA blade to handle. Suitable for cutting media from 0.25 mm to 0.5 mm thick.
CB15U-K30 (supersteel) 	ϕ 1.5 mm 0.75	PHP32-CB15N or PHP32-CB15	For cutting sandblast rubber. The sharply angled point provides a longer cutting edge. Suitable for cutting material from 0.05 mm to 1.5 mm thick.
CB15-10C (ceramic) 	ϕ 1.5 mm 0.50	PHP31-CB15	This is the hardest blade, but may chip or shatter if dropped or subjected to impact. Suitable for cutting material up to 0.05 mm thick.
CB15-05S (sapphire) 	ϕ 1.5 mm 0.25	PHP31-CB15	For cutting masking media. Suitable for cutting material up to 0.05 mm thick.

Cutter Pen Nomenclature

WARNING: To avoid injury, handle cutter blades carefully.

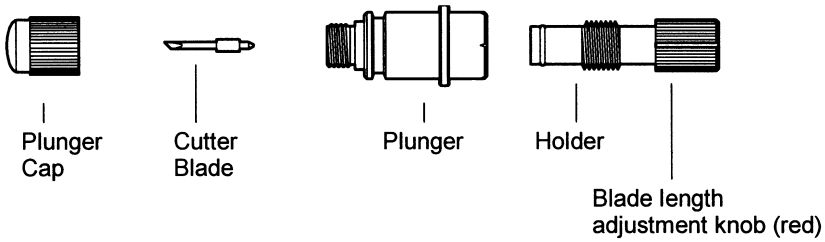
PHP32-CB09N Cutter Pen

(For cutter blades of 0.9 mm diameter)



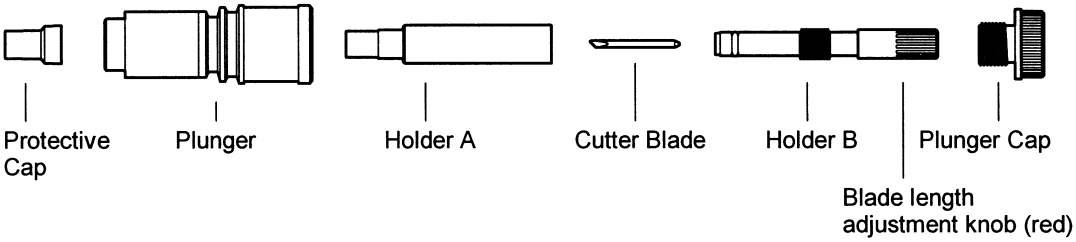
PHP32-CB15N Cutter Pen

(For supersteel cutter blades of 1.5 mm diameter)



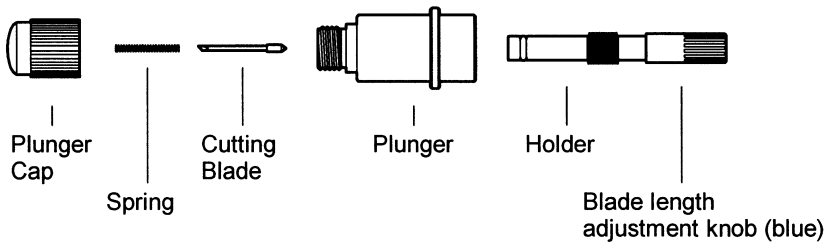
PHP31-CB15 Cutter Pen

(For ceramic and sapphire cutter blades of 1.5 mm diameter)



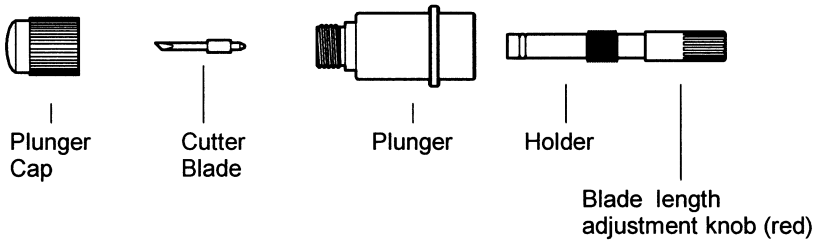
PHP32-CB09 Cutter Pen

(For cutter blades of 0.9 mm diameter)



PHP32-CB15 Cutter Pen

(For supersteel cutter blades of 1.5 mm diameter)



Replacing the Cutter Blade

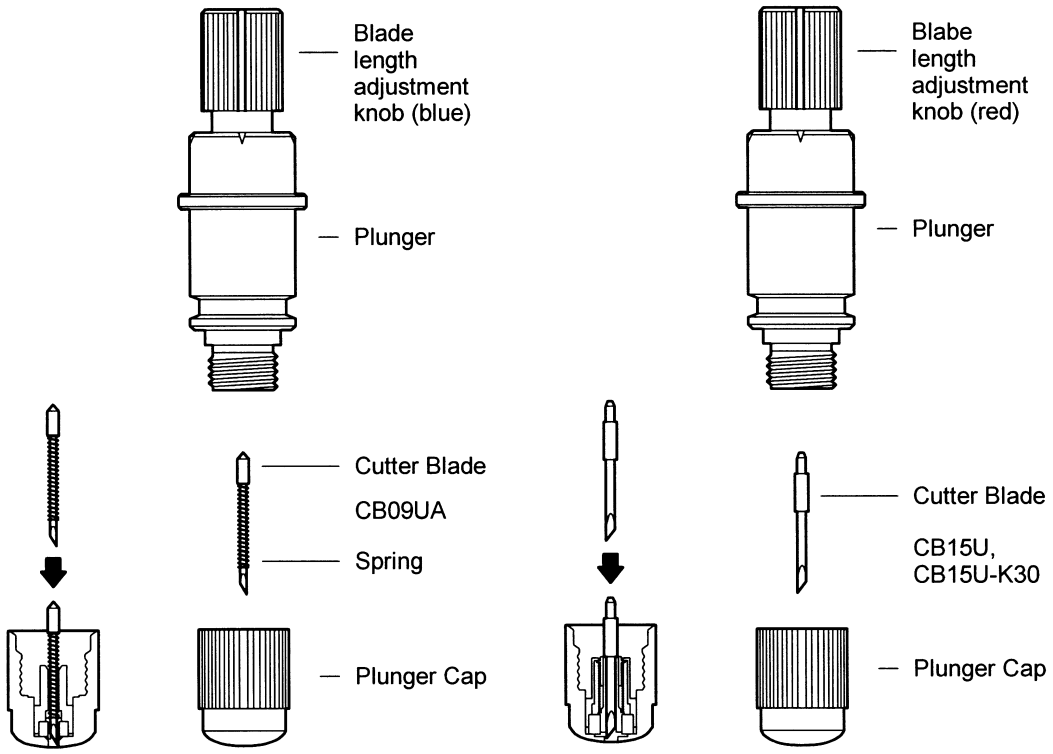
WARNING: Will cause injury to the Operator.

Various types of plungers are available which correspond to the diameter and type of the blade used. Check the cutter blade you are going to use and its appropriate cutter offset value against the table below.

Cutter pen	Color classification	Compatible blade types	Blade material	Cutter offset values
PHP32-CB09	Blue	CB09UA	Supersteel	18 ± 2
PHP32-CB15	Red	CB15U	Supersteel	28 ± 2
		CB15U-K30	Supersteel	28 ± 2
PNP31-CB15	Red	CB15-10C	Ceramic	18 ± 2
		CB15-05S	Sapphire	9 ± 2

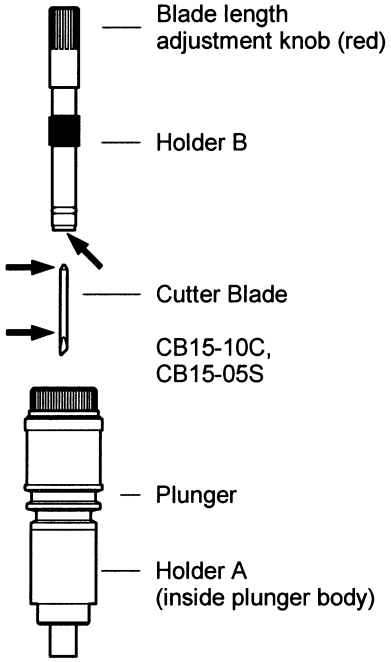
Replacing Supersteel Blades in the PHP32-CB09(N) & PHP-CB15(N)

1. Turn the plunger cap counterclockwise.
2. Remove the plunger cap.
3. Remove the blade and spring from the plunger cap.
4. Stand the cap upright.
5. Insert the new blade and spring into the hole.
6. Reattach cap to the plunger.



Replacing Ceramic & Sapphire Blades in the PHP31-CB15

1. Turn the blade length adjustment knob counterclockwise.
2. Remove the holder (B).
3. Remove the blade from the holder (A).
4. Point the tip of holder (A) downward.
5. Insert new blade.
6. Make sure blade is inserted straight. Gently tap the plunger to correct angled blades.
7. Point the tip of holder (A) downward.
8. Attach the holder cap.
9. Turn the blade length adjustment knob clockwise until the blade tip is visible.



TIP: If the blade does not rotate smoothly or the blade falls off after attaching the cutter pen to the pen carriage, the inside of the holder is insufficiently lubricated. Apply grease provided to the three (3) points indicated by arrows in the figure above.

TIP: The blades can also be replaced from the front of the plunger.

1. Turn the blade adjustment knob fully clockwise.
2. Remove the blade from the front of the plunger.
3. Replace the blade.
4. Turn the blade adjustment knob counterclockwise.

NOTE: To view video to replacing blade.

For PC:

Open the Manual CD.

Double click on the Blade.avi file to start viewing the video or run Media Player, then open Blade.avi file.

For Macintosh:

Open the Manual CD.

Double click on the Blade.mov file to start viewing the video.

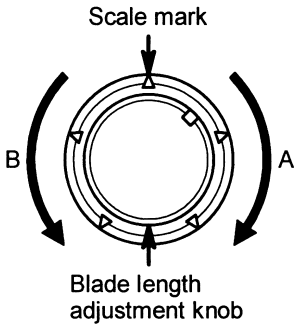
Blade Length

CAUTION: Make sure to correctly adjust the blade length. If the blade length is too long for the thickness of the media being used, you may cut through the cutting mat and damage your plotter.

Adjusting the Blade Length

1. Retract the blade by turning the blade adjustment knob in a counterclockwise direction (B direction) until the blade tip is aligned with the tip of the cutter pen, then extend the blade by turning the blade adjust knob in a clockwise direction (A direction) until the blade tip reaches a suitable length.

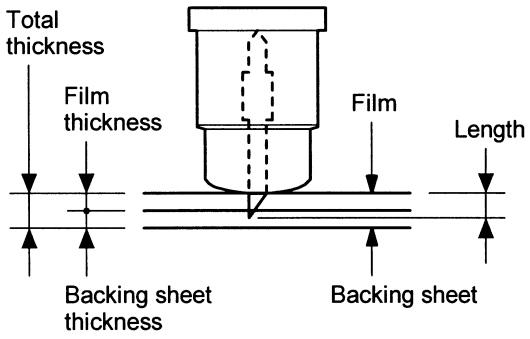
2. Observe the scale on the plunger cap to determine how far to move the blade. When the knob is turned the distance of one scale unit, the blade moves 0.1 mm. One full turn moves the blade 0.5 mm.



Obtaining the Correct Blade Length

The blade length should never be greater than the combined thickness of the media and its backing sheet.

If the media thickness cannot be accurately determined, adjust the blade length gradually until only traces of the blade appear on the backing sheet when a cutting test is executed.

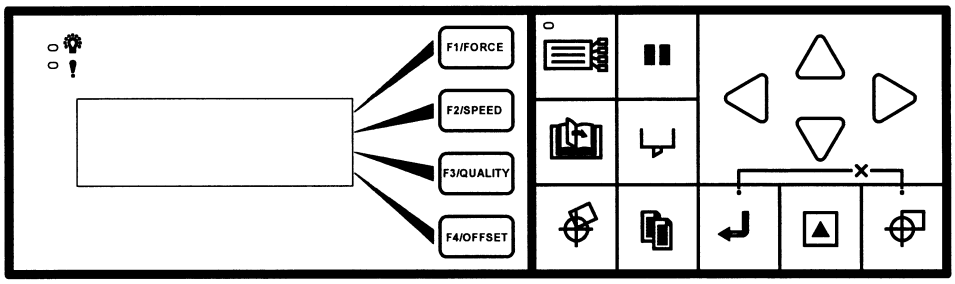


For more information about the cutting test, see "**Running a Cutting Test.**"

Chapter 3 Preparing to Cut

This chapter describes how to use the control panel, load the media, select and install the appropriate cutting tools, and to achieve the best cutting results.

Control Panel



Indicator Lamps

The POWER lamp remains lit (green) while the plotter is on.

The PROCESSING INDICATOR lamp lights green when the cutting data goes beyond the effective cutting area.

Select Keys

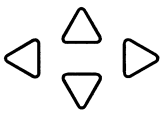
Soft keys are keys whose function changes as each menu changes. Depending on the menu being displayed, these keys are used to:

F1/FORCE
F2/SPEED
F3/QUALITY
F4/OFFSET

- Load a group of cutting conditions retained in the plotter's memory;
- Select the desired submenu
- Select the desired parameters

Position Keys

All four keys are used to move the pen carriage when setting a function that requires the specification of a coordinate position. The moving speed of the pen carriage can be controlled in two levels by changing pressure applied to the position keys.



- Used to raise the displayed numeric setting of a function.
- Used to select the numeric setting of a function.
- Used to select the pen type when setting a group of cutting conditions.
- Used to shift the cursor when setting a numeric value for a function.

Menu Keys

Press MENU CONTROL to get into MENU mode to set functions at the control panels (its green lamp lights). Press MENU CONTROL again to cancel menu mode. The plotter continues to store data from the computer in the plotter's receive buffer although the cutting or plotting operation is temporarily suspended.

Press ENTER after setting a function at the control panel to register your setting. The cutting area can also be displayed by pressing ENTER key in ready status.

To reset the plotter, press ENTER and ORIGIN together in the MENU mode.

Press ORIGIN to move the origin point. ***See the section ORIGIN in Chapter 4 Advanced Functions and Settings for details.***

Press COPY to repeat the cutting operation defined by the data in the plotter's receive buffer. ***See the section COPY in Chapter 4 Advanced Functions and Settings for details.***

Press CONDITION to set the four groups of cutting conditions retained in the plotter's internal memory. ***See the section Setting Conditions for details in this chapter.***

CAUTION: Excessive SPEED and QUALITY parameters in CONDITION mode may trigger the position alarm to reset the system or system overload. An overloaded system triggers the product's circuit protection.

Should the system overload, causing the power to shut down, turn off the power switch and unplug the power cord. After 5 to 10 minutes, connect the power and turn on the system. For more information, see ***Chapter 6 Test Modes and Troubleshooting***.

Press TEST to run a cutting test to check whether the currently selected cutting conditions are compatible with the media loaded. ***See Running Cutter Tests for details in this chapter.***

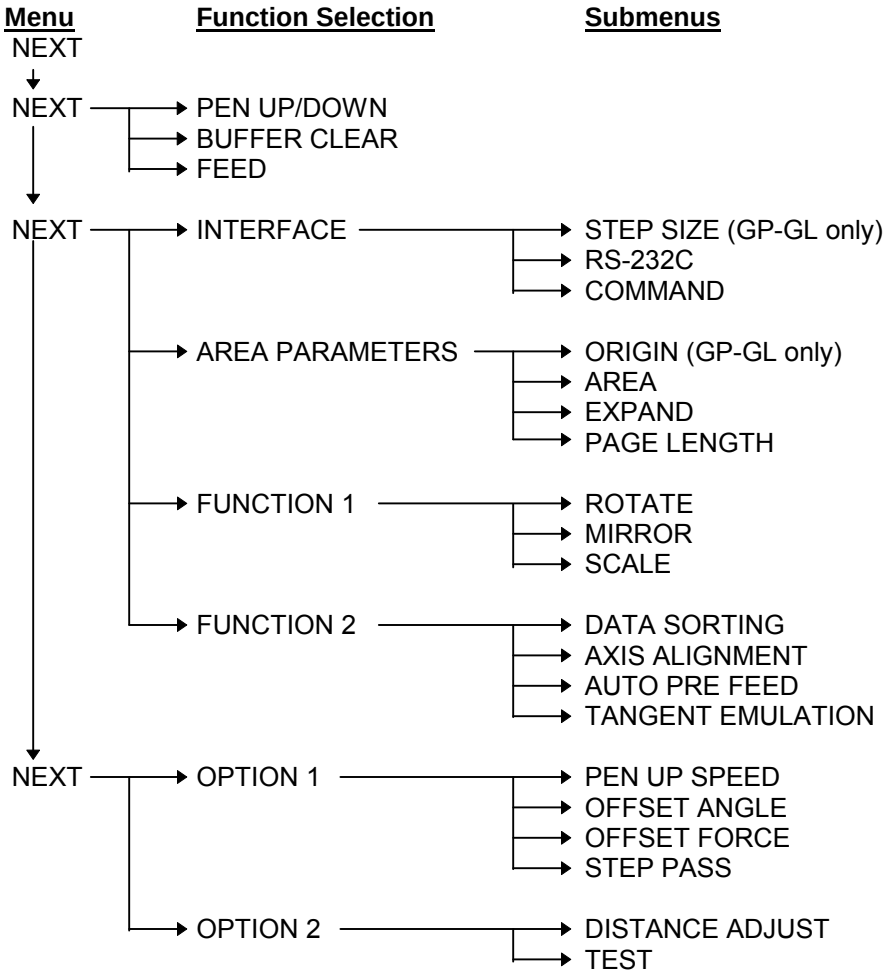
Press NEXT to scroll through the functions in the control panel or to return to the previous menu with no registration of the setting.

Press HOLD to suspend the cutting or plotting temporarily. While the cutter is suspended, the media set lever can be lowered to reset the media if necessary. The plotter is then not initialized, and is ready to continue or quit the suspended job.

Press AXIS ALIGN to get into the axis alignment adjustment mode. ***See the section Axis Alignment in Chapter 4 Advanced Functions and Settings for details.***

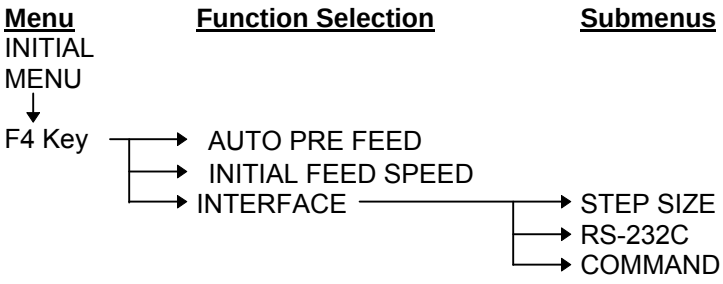
Selecting a Function Menu

When the plotter is in MENU mode (the MENU lamp is lit), each of the functions listed below in the “Function Selection” column can be accessed by pressing the NEXT key until the desired menu appears and then pressing the select key indicated by a box.



Initial Menu

When the paper set lever is lowered, the initial menu appears on the LCD**.**



Setting the Multilanguage Display

Your plotter's display can be set to one of 12 different languages. To select the language:

Turn the power on while pressing the DOWN ARROW key and the Menu selection display then appears.

Press the UP and DOWN ARROW keys to scroll through the languages (Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish)

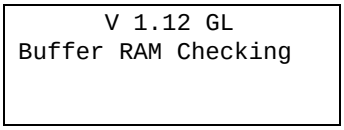
Press ENTER key to select the language and then turn the power off, then on.

Turn on the Plotter

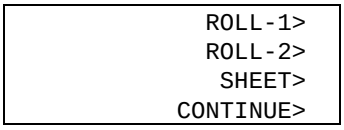
- Check to make sure that the pen carriage is not located near the pinch rollers so that it does not interfere with the pinch roller settings.

- After checking that both ends of the plotter's power cord are securely connected, turn on the plotter by pressing the "|" side of the POWER switch.

- The control panel's POWER lamp (green) lights and the plotter initializes and the main menu is displayed. This screen displays the firmware's version number and selected command set. The screen displays either GL or HL. The GL shows that the GP-GL Command set is selected and the HL shows that the HP-GL command set is selected.



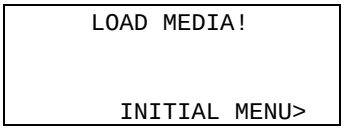
If you have already loaded media, the media type menu appears.



NOTE: CONTINUE does not appear in the media type menu during the first initialization after turning the power on. All the menus in this section include CONTINUE assuming that it is the one in the second or a later initialization.

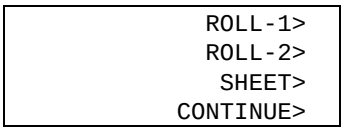
If no media is loaded, you are prompted to do so.

Press the F4 key to change parameters such as initial feed speed or interface settings.



NOTE: If you are using media that tends to skew while cutting, the initial feed speed setting should be set to SLOW.

Media type menu appears as soon as the media set lever is raised to secure the loaded media.



Loading Media

This section describes the steps for loading media in the plotter. Note that the media can be loaded either before or after turning on the plotter.

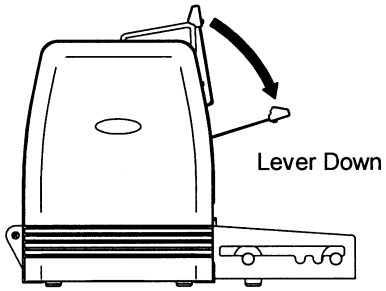
CAUTION: Be sure to move the pen carriage slowly. Moving the pen carriage quickly may damage the plotter.

NOTE: If necessary, slowly move the pen carriage out of the way while the power is off. After the first initialization, use the arrow keys to move the pen carriage.

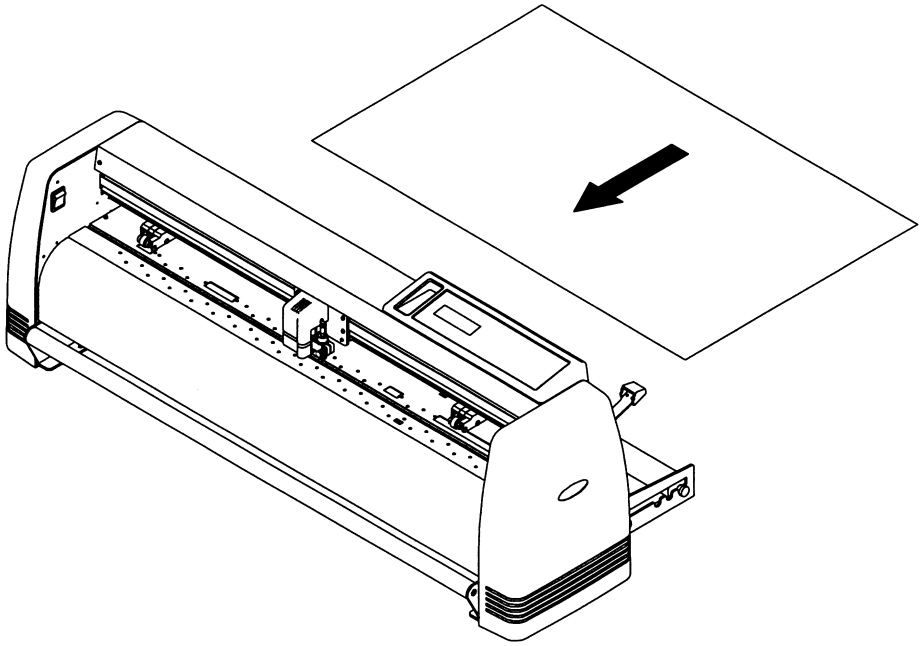
Sheet Media

CAUTION: To avoid damaging the cutting mat, make sure to set the media type to SHEET when using sheet media. Whenever possible, use sheet media of rectangular shape.

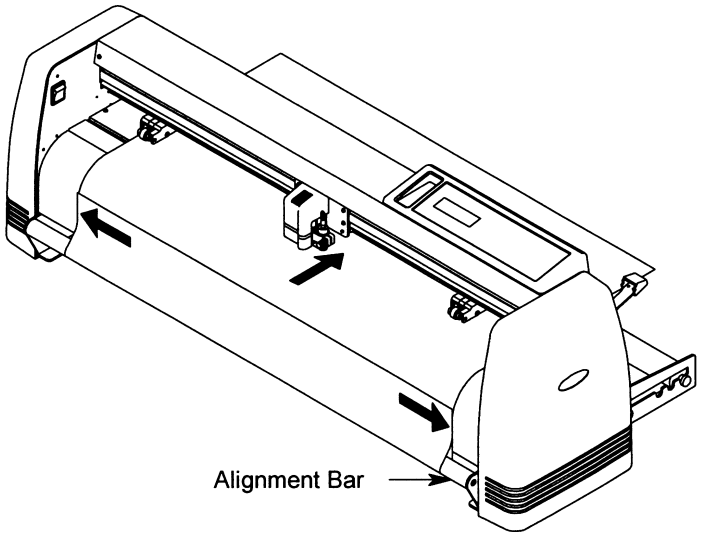
1. Load the Media
   a) Lower the media set lever to raise the pinch rollers.

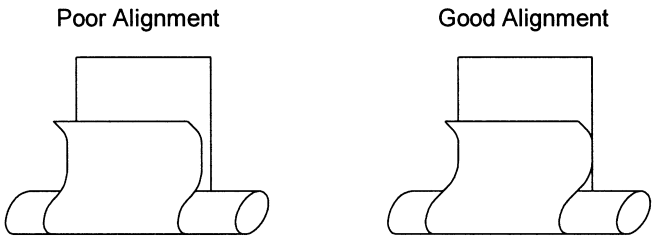


   b) Load the media in the plotter. Use the yellow markings to locate the grit rollers. Place the media so that its edges align with the grit rollers.

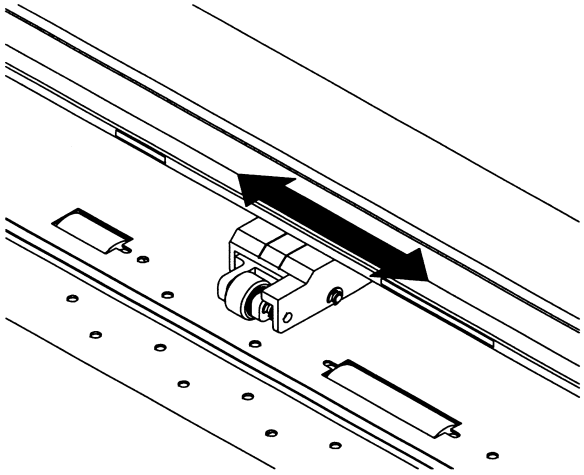


c) Wrap media behind and around the media alignment shaft. While keeping tension on the vinyl, adjust the vinyl edges so that both edges match accurately.

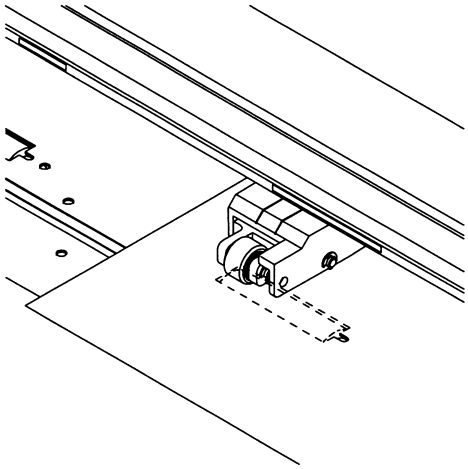




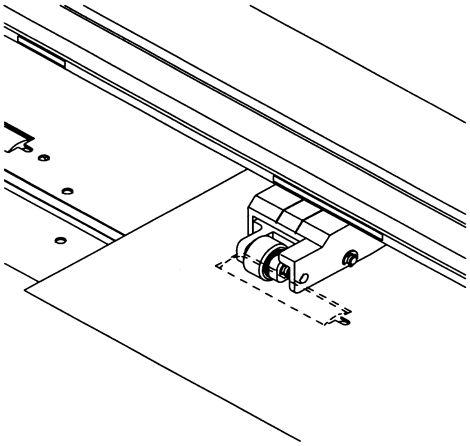
2. Adjust the pinch roller positions
   - Position the left and right pinch rollers to correspond with the width of the media.
   - When moving the media to the left or right be sure to move the pinch rollers as required to hold down the media within the appropriate range.
   - Be sure to position the pinch rollers so that they are not located right at the edges of the media or grit rollers.
   - The FC4100-100 and FC4100-130 plotters have a middle pinch roller that should be positioned in the center of the media.



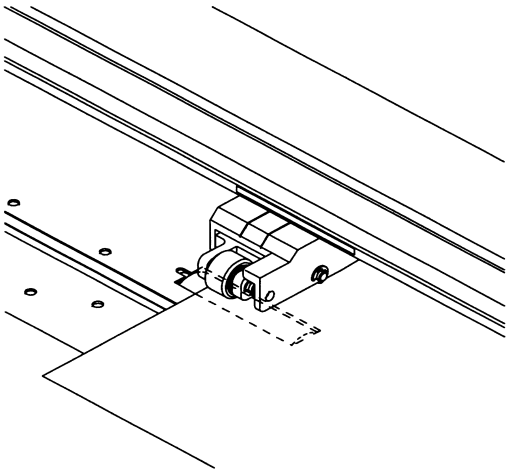
Too close to grit roller edge



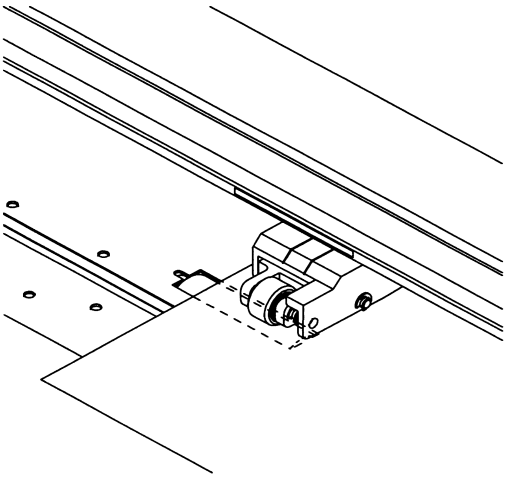
Good grit roller position



Too close to media edge

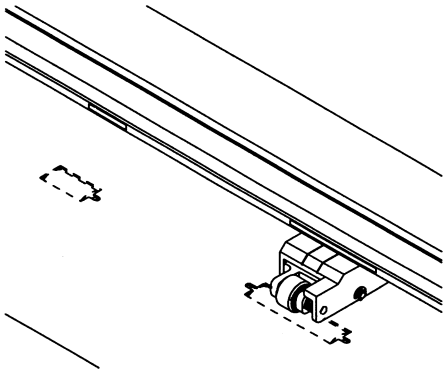


Good media position

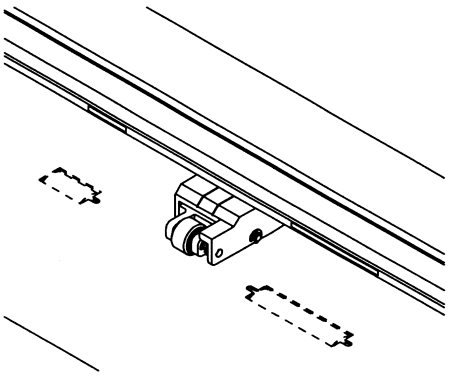


CAUTION: The position of the Middle Pinch Roller on the FC4100-100 and FC4100-130 Cutting Plotters effects the cutters performance.

- If the middle pinch roller is not positioned in the center range of the media AND located over the grit roller, the media will not feed evenly.



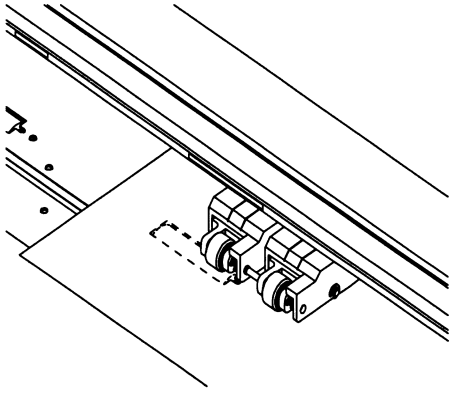
Good Pinch Roller Position



Poor Pinch Roller Position

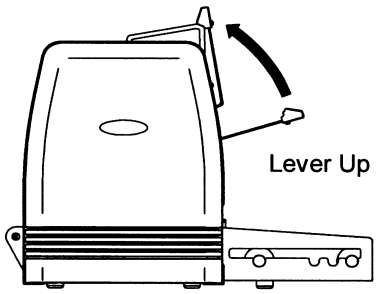
CAUTION: When cutting narrow media that is 10 inches or smaller, the position of the Left and Middle Pinch Rollers will effect the performance of the FC4100-100 and FC4100-130 Cutting Plotters.

- Lower the media set lever to raise the pinch rollers.
- Move the left pinch roller next to the middle pinch rollers.
- Move both the left and middle pinch rollers together until they reach the right stop.
- Load the media so that the left side of the narrow media under the left pinch roller.
- Adjust right pinch roller over the right side of the media.
- Raise the media set lever to lower the pinch rollers.



Good Pinch Roller Position

3. Then lower the pinch rollers (raise the lever) and pull the vinyl out from the alignment bar.



4. Turn on the Power if it is off.

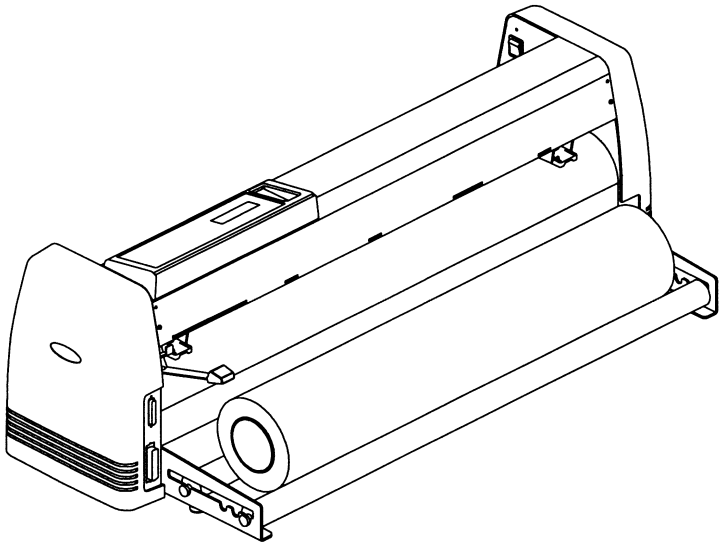
```
      V 1.12 GL
Buffer RAM checking
```

5. Plotter performs the initialization routine.

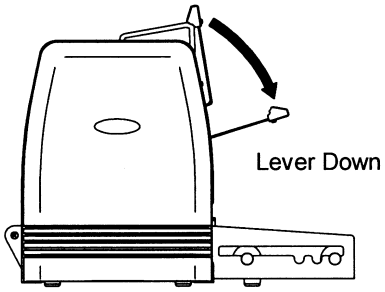
6. Loading of the media is complete

Roll Media

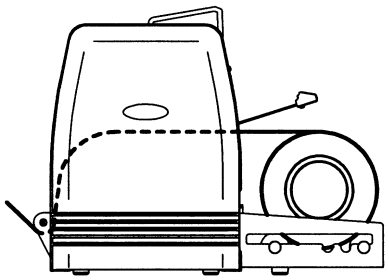
1. Load the Media
   a) Place the roll of media on the media stocker. Use the yellow markings to locate the grit rollers. Place the media so that its edges align with the grit rollers.



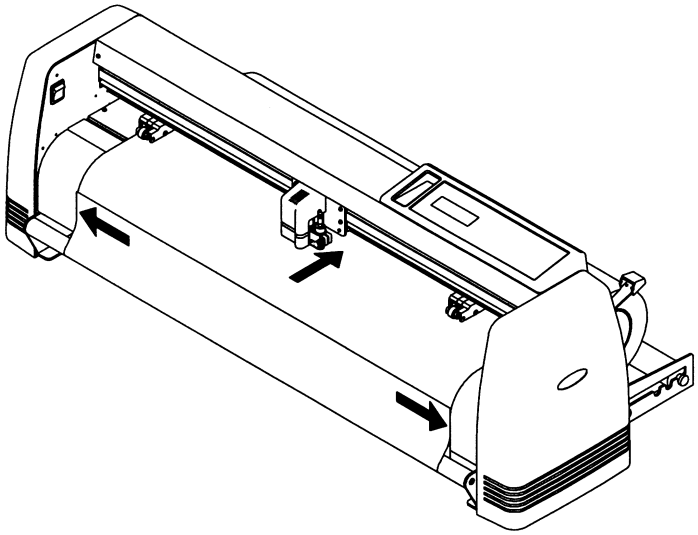
   b) Lower the media set lever to raise the pinch rollers.



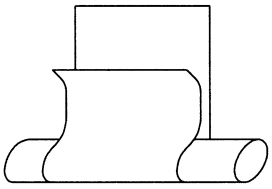
c) Load the media in the plotter as shown.



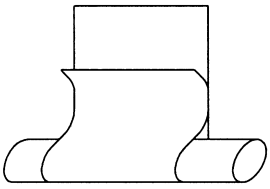
d) Wrap media behind and around the media alignment shaft. While keeping tension on the vinyl, adjust the edges of the vinyl so that both edges match accurately.



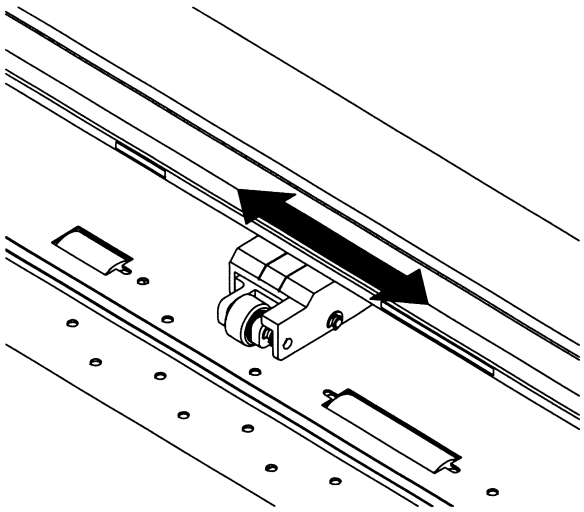
Poor Alignment



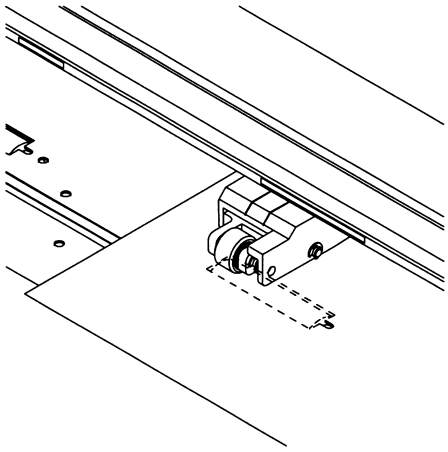
Good Alignment



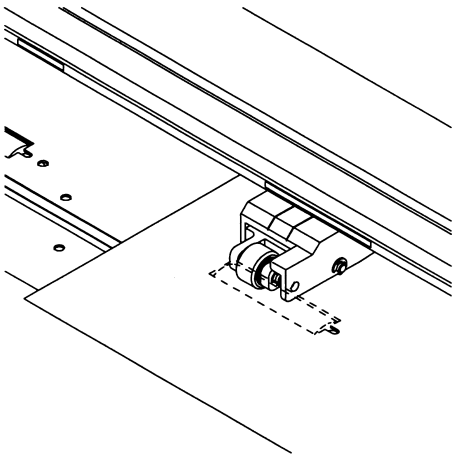
2. Adjust the pinch roller positions
   - Position the left and right pinch rollers to correspond with the width of the media.
   - When moving the media to the left or right be sure to move the roll as required to ensure that no slack develops in the media.
   - When moving the media to the left or right be sure to move the pinch rollers as required to hold down the media within the appropriate range.
   - Be sure to position the pinch rollers so that they are not located right at the edges of the media or grit rollers.
   - The FC4100-100 and FC4100-130 plotters have a middle pinch roller that should be positioned in the center of the media.



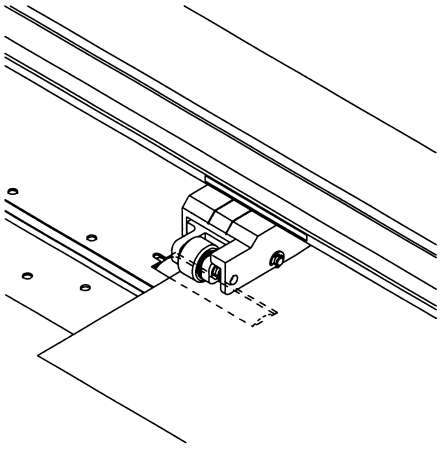
Too close to grit roller edge



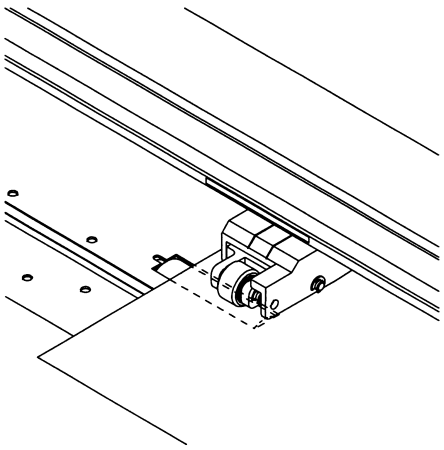
Good grit roller position



Too close to media edge

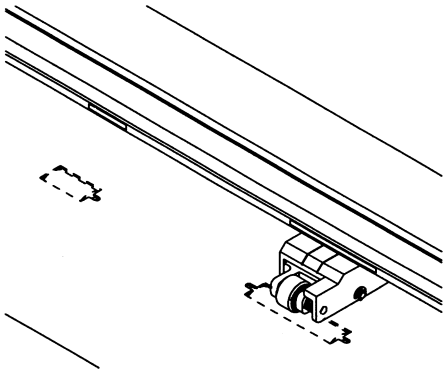


Good media position

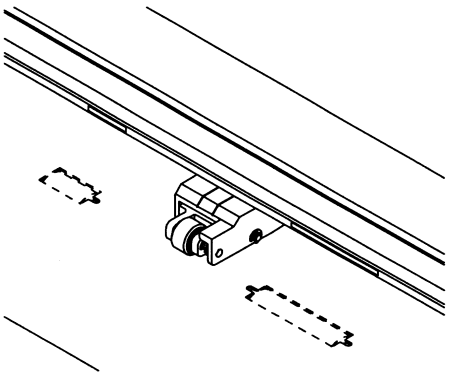


CAUTION: The position of the Middle Pinch Roller on the FC4100-100 and FC4100-130 Cutting Plotters effects the cutters performance.

- If the middle pinch roller is not positioned in the center range of the media AND located over the grit roller, the media will not feed evenly.



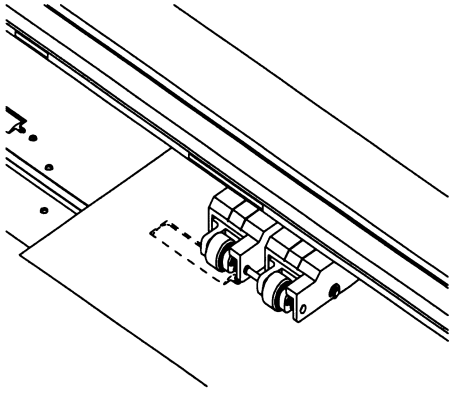
Good Pinch Roller Position



Poor Pinch Roller Position

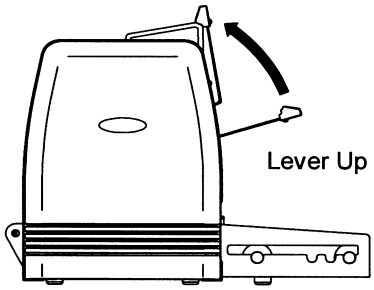
CAUTION: When cutting narrow media that is 10 inches or smaller, the position of the Left and Middle Pinch Rollers will effect the performance of the FC4100-100 and FC4100-130 Cutting Plotters.

- Lower the media set lever to raise the pinch rollers.
- Move the left pinch roller next to the middle pinch rollers.
- Move both the left and middle pinch rollers together until they reach the right stop.
- Load the media so that the left side of the narrow media under the left pinch roller.
- Adjust right pinch roller over the right side of the media.
- Raise the media set lever to lower the pinch rollers.

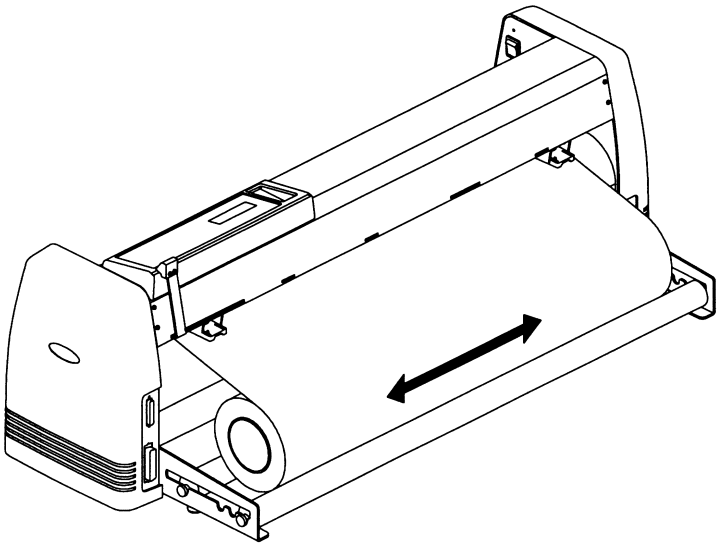


Good Pinch Roller Position

3. Then lower the pinch rollers (raise the lever) and pull the vinyl out from the alignment bar.



4. Re-adjust the position of the roll as necessary to remove slack between the roll and pinch rollers.

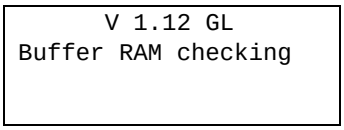


NOTE: The length of the media at the front of the plotter should be sufficient to completely cover the paper sensor. If the front edge extends too far when you have pulled the media taut, wind the media back onto the roll.

NOTE: To view video to loading media.
For PC:
Open the Manual CD.
Double click on the Load.avi file to start viewing the video or run Media Player, then open Load.avi file.
For Macintosh:
Open the Manual CD.
Double click on the Load.mov file to start viewing the video.

5. Hold the Media down
   - Check there is no slack in the media between the roll and the front edge, reposition the media roll if necessary.
   - Turn the roll of media so that you can pull out the amount you require for your cutting operation. (You can also use the plotter's feed function to feed out the specified amount of media).
   - Before your start a long-length cutting operations, hand feed out the length that will be required for the cutting operation. Let the media sit for 30 minutes to be acclimated to the environment before starting the cutting operation. Next use the plotter's feed function to feed out the specified amount of media needed for your cutting operation.

6. Turn on the Power if it is off.



7. Plotter performs the initialization routine.

8. Loading of the media is complete.

Select the Media Type

CAUTION: To avoid damaging the cutting mat, make sure to set the media type to SHEET when using sheet media. Whenever as possible, use sheet media of rectangular shape.

If you have already loaded media, the media type menu appears. Select the media type.

```
ROLL-1>
ROLL-2>
SHEET>
CONTINUE>
```

ROLL–1

Detects the leading edge of the roll media. The coordinate origin is initialized with respect to the media's leading edge.

F1/FORCE Press F1 key to select ROLL-1

```
ROLL-1>
ROLL-2>
SHEET>
CONTINUE>
```

The initialization routine is executed to determine the paper size and origin point.

Then CUT AREA shows the effective cut area that is determined by the position of the pinch roller and the page length setting.

```
CUT AREA

X= 2000mm  Y=  730mm
```

ROLL–2

The leading edge of the roll media is not detected and the coordinate origin is initialized with respect to the cutting mat.

F2/SPEED Press F2 key to select ROLL-2

```
ROLL-1>
ROLL-2>
SHEET>
CONTINUE>
```

The initialization routine is executed to determine the paper size and origin point.

Then CUT AREA shows the effective cut area that is determined by the position of the pinch roller and the page length setting.

```
CUT AREA

X= 2000mm  Y=  730mm
```

NOTE: After initializing the plotter by choosing ROLL-1 or ROLL-2, use the FEED function to pre-feed the length of media needed for the job. This embosses the grit roller pattern onto the media to help prevent media skewing or excessive system torque which triggers the position alarm. The position alarm resets the system or if the system is overloaded, it triggers the product's circuit protection causing power to shut down.

Should the system overload, causing the power to shut down, turn off the power switch and unplug the power cord. After 5 to 10 minutes, connect the power and turn on the system. For more information, see ***Chapter 6 Test Modes and Troubleshooting***.

SHEET

Detects both the leading and trailing edges

F3/QUALITY Press F3 key to select SHEET

```
                ROLL-1>
                ROLL-2>
                 SHEET>
               CONTINUE>
```

The initialization routine is executed to determine the paper size and origin point.

CUT AREA shows the effective cut area that is determined by the position of the pinch roller position and the page length setting.

```
        CUT AREA

X=   830mm   Y=   730mm
```

CONTINUE

This function is useful and will save time if you intend to cut a large quantity of the same size media. This selection is available from the second initialization after turning power on. Therefore CONTINUE in the media selection menu does not appear on the first initialization after turning power on. Plotter assumes that the media is the same size as the last one that was loaded on the plotter and does not detect the media's edges. To use the CONTINUE effectively, set the media so that the current pen carriage position can be located at the same place as it was on the last media.

F4/OFFSET Press F4 key to select CONTINUE

```
                ROLL-1>
                ROLL-2>
                 SHEET>
               CONTINUE>
```

No sensing operations are performed

Set the various functions of the plotter as desired.

NOTE: Make sure to set the cutting conditions to suit the cutter blade and media being used. ***For details see Setting Conditions.***

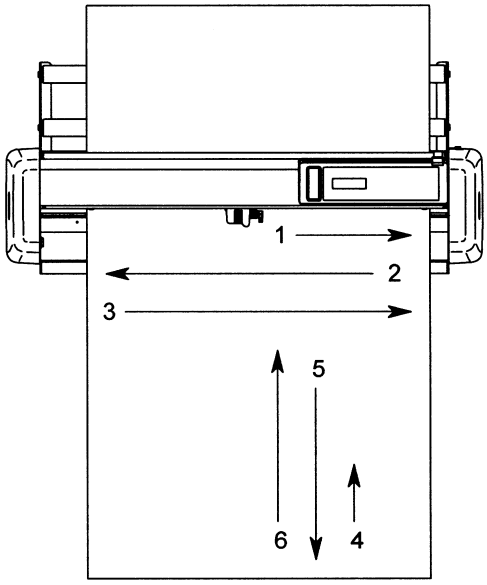
Initializing Routine

ROLL-1

1. During initialization, the pen carriage moves right until it detects the mechanical home position.
2. The pen carriage then moves left until it detects the left hand side of the media edge.
3. It then returns to the right edge of the media.
4. The media is fed backwards until the media's leading edge is detected.

ROLL-2

1. During initialization, the pen carriage moves right until it detects the mechanical home position.
2. The pen carriage then moves left until it detects the left hand side of the media edge.
3. It then returns to the right edge of the media.



SHEET

1. During initialization, the pen carriage moves right until it detects the mechanical home position.
2. The pen carriage then moves left until it detects the left hand side of the media edge.
3. It then returns to the right edge of the media.
4. The media is fed backwards until the media's leading edge is detected.
5. The media is then fed forward until the media's trailing edge is found.
6. The media is fed backwards until the pen carriage locates the lower left position of the cutting area.

CONTINUE

Does not perform initialization, begins plotting from the pen carriage's current position.

Set the various functions of the plotter as desired.

NOTE: Make sure to set the cutting conditions to suit the cutter blade and media being used. ***For details see Setting Conditions.***

Setting Conditions

This function lets you register four different groups of conditions in the plotter's memory. These conditions greatly affect the finished quality of the cutting operation. The desired group can be quickly loaded by simply pressing the corresponding select key 1 through 4 at the control panel. Each group consists of four parameters as described below:

Cutting Force (Pen Pressure): Sets the force to be applied by the cutter blade during cutting, the hole punching force during pouncing, and the plotter pen pressure during plotting.

Speed: Sets the traveling speed of the lowered pen.

Quality: Sets the acceleration rate of the pen during cutting or plotting.

Cutter Offset: Sets the cutter blade control factor that greatly affects the shape of corners. This parameter consists of two parameters such as the tool type and the offset value. Select the tool you wish to use first, then set the value.

NOTE: The selected conditions greatly affect the finished quality of cutting operations.

NOTE: Raising the SPEED and QUALITY values result in lower precision but reduced overall cutting time. This is useful when making test runs.

NOTE: Lowering the SPEED and QUALITY values result in high precision but increased overall cutting time.

Select the Tool from the Menu

Press the function key [F1] through [F4] corresponding to the number of the group whose registered tool you wish to change.

```
CONDITION 2      14
                 30
  MENU MODE       4
           CB09Ux 0
```

Press the CONDITION key to select the tool.

Press the F4 key to select the tool you wish to use. A blinking cursor appears next to your choice.

```
CONDITION 2      14
                 30
  MENU MODE       4
           CB09Ux 0
```

Press the RIGHT or LEFT ARROW key to scroll through the tool selection

You can select one of the following tools:

- Select one of the following cutter blades: CB09Ux, CB15-10Ux, CB15Ux, CB15U-K30x, CB15-10Cx, CB15-05Sx.
- Select OTHER when above preset values and their deviation ranges cannot cover the range needed for satisfactory results.
- Select PEN to use a plotter pen.
- Select POUNCE to use the pouncing pen.
- Select LIGHT POINT to use the light pointer to check the cutter pass.

NOTE: These tool names are actually the names of preset offset values, and each value can be changed within a range from -5 to +5.

NOTE: The suffix “x” represents any cutter suffix within the family. For example, select CB09Ux when using a CB09UA cutter.

NOTE: When you select POUNCE, the cutter offset refers to the spacing between the holes**.**

↵ Press the ENTER key to select the tool.

TANGENTIAL mode

Besides cutter blade selection noted above, you can select the tangential emulation mode to cover more selection of media. ***For details see Tangential Emulation in Chapter 4 Advanced Functions and Settings.***

Cutter Conditions

To change the setting of a group of conditions, press the function key [F1] through [F4] corresponding to the number of the group you wish to change. For example, press the F2 key to select CONDITION 2.

Press the CONDITION key to get into the condition menu.

Press the NEXT key to cancel the condition where you are currently set and return to the main menu.

NOTE: If the Tangential emulation mode is enabled for the condition number that you are currently working on, the overcut menu appears as soon as the ENTER key is pressed. Change the values, if necessary. ***For details see Tangential Emulation***.

To Change the Cutter Force

Press the F1 key to change FORCE. The blinking cursor indicates that you can change its setting.

```
     SET          14
CONDITION 2       30
                   4
          CB09Ux   0
```

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 35.

Press the F2 key to change SPEED.

Press the F3 key to change QUALITY.

Press the F4 key to change OFFSET.

Press the ENTER key to register your setting.

To Change the Cutter Speed

Press the F2 key to change SPEED. The blinking cursor indicates that you can change its setting.

```
     SET          14
CONDITION 2       30
                   4
          CB09Ux   0
```

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 90 and +. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, +.]
The "+" is 126cm/sec speed.

NOTE: The "+" selection is available with firmware version 1.13 or later.

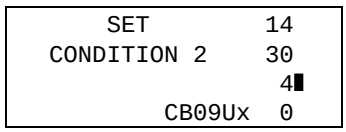
Press the F1 key to change FORCE.

Press the F3 key to change QUALITY.

Press the F4 key to change OFFSET.

Press the ENTER key to register your setting.

To Change the Cutter Quality



Press the F3 key to change QUALITY. The blinking cursor indicates that you can change its setting.

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality.

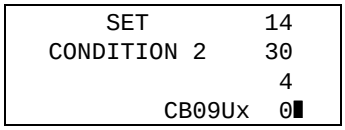
Press the F1 key to change FORCE.

Press the F2 key to change SPEED.

Press the F4 key to change OFFSET.

Press the ENTER key to register your setting.

To Change the Cutter Offset



Press the F4 key to change OFFSET. The blinking cursor indicates that you can change its setting.

Press the UP or DOWN ARROW key to raise or lower the numeric value from –5 to +5. *For more information, see* ***Running Cutting Test.***

Press the ENTER key to register your setting.

Fine Adjustment

1. Set the blade type to OTHER to permit fine adjustment of the CUTTER OFFSET value.

2. While referring to the figures above, gradually adjust the cutter offset value while checking the results by running a cut test.

Running Cutting Test

The TEST function allows you to check the suitability of your condition settings. If the test results are not satisfactory, adjust the settings as described in ***Cutter Conditions****.*

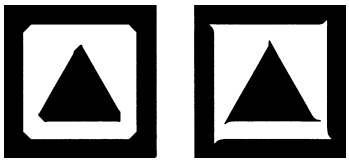
WARNING: The cutter pen starts moving as soon as a cutting test is selected. To avoid injury to yourself and damage to the plotter, load the media before pressing the [TEST] key and then keep your hands, face and other obstacles out of the vicinity of the cutting mat and media.

To achieve the best cut quality, and to increase the blade's life, the cutter condition setting is very important. Since the cutter condition depends on the media type and thickness, perform a cut test to check your settings and fine-tune the cut quality BEFORE starting your new cutting job. Follow these steps to achieve good cutter condition settings:

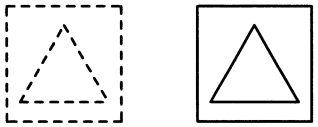
1. Cut the test pattern (Test 1, Test 2, Cutting Pro) in three locations: the far right side, the center and the far left side of the media.
2. Check the shape of the pattern.
3. Change the condition parameters if needed.
4. Repeat steps 1 through 3 until the test results are satisfactory.

The following illustrations show test pattern results.

1. Peel the outside triangle off first to view the shape of the corners. The corner's shape represents the cutter offset setting.
   If the corners are rounded, the cutter offset value should be decreased, but if the corners are too sharp, the cutter offset value should be increased.



2. Next peel the triangle off the liner to view the depth of the cutter trail. The depth of the cutter trail represents the blade length. The best setting creates a light scratch on the liner.
   If it is too light and the trail breaks in places, increase the blade length, but if it so heavy that it cuts the liner, the blade should be shortened.

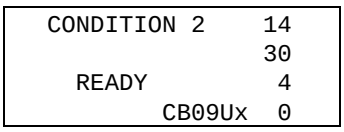


3. Change the parameters as needed.
4. Repeat steps 1 through 3 until the test results are satisfactory.

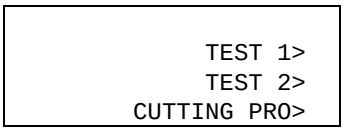
Test 1

Use this TEST 1 pattern to test your condition settings.

With the media loaded in the plotter and the READY or PAUSE mode displayed on the menu,



Press the TEST key on the Control Panel. You will see the following test menu.



F2/SPEED Press the F2 key to select TEST 1.

The plotter immediately cuts one (1) triangle from the current pen position.

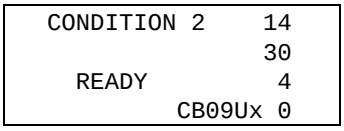
- Adjust the cutting conditions and re-run the cutting test.
- Repeat this process until you achieve the desired results.

Press the ENTER key to return to the READY mode when the results are satisfactory.

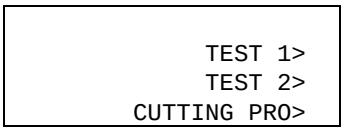
Test 2

If you feel you have almost achieved the best condition, use the TEST 2 pattern. This test cuts three triangle patterns in 3 different cutting forces. The center triangle is cut using the force you selected. The left triangle is cut using a force that is one step lower than your selection. The right triangle is cut using a force that is one step higher than your selection. This allows you to confirm that your force selection is the best.

With the media loaded in the plotter and the READY or PAUSE mode displayed on the menu,



Press the TEST key on the Control Panel. You will see the following test menu.



F3/QUALITY Press the F3 key to select TEST 2.

The plotter immediately cuts three (3) triangles from the current pen position.

- Adjust the cutting conditions and re-run the cutting test.
- Repeat this process until you achieve the desired results.

Press the ENTER key to return to the READY mode when the results are satisfactory.

Cutting Pro

Use the CUTTING PRO Test pattern to check your cutting quality with an actual cut pattern without having to access your application software.

With the media loaded in the plotter and the READY or PAUSE mode displayed on the menu,

```
CONDITION 2   14
              30
  READY        4
       CB09Ux  0
```

▲ Press the TEST key on the Control Panel. You will see the following test menu.

```
            TEST 1>
            TEST 2>
       CUTTING PRO>
```

F4/OFFSET Press the F4 key to select CUTTING PRO.

F3/QUALITY Press the F3 key to select YES and start.

F4/OFFSET Press the F4 key to select NO and cancel.

```
PATTERN CUTTING PRO
        OK ?
               YES>
                NO>
```

- Adjust the cutting conditions and re-run the cutting test.
- Repeat this process until you achieve the desired results.

↵ Press the ENTER key to return to the READY mode when the results are satisfactory.

Plotter Pen Conditions

To change the setting of a group of conditions, press the function key [F1] through [F4] corresponding to the number of the group you wish to change. For example, press the F1 key to select CONDITION 1.

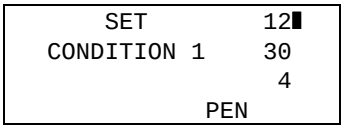
Pen Reference Values

The table below gives the recommended settings for each pen condition.

Pen type	FORCE	SPEED	QUALITY
Water-based fibertip pen	10 to 12	30	4
Oil-based fibertip pen	10 to 12	20	2
Water-based ballpoint pen	15 to 18	60	4
Ceramic pen	7 to 8	20	2
Ink pen	4 to 7	10	2

NOTE: The condition settings will vary according to the type of paper used. To prolong the life of your pen keep the FORCE setting as low as possible. Set the SPEED according to the type of output quality required.

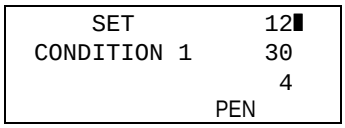
Press the CONDITION key to get into the condition menu.



NOTE: Press the NEXT key to cancel the condition that you are currently setting and return to the main menu.

To Change the Pen Force

Press the F1 key to change FORCE. A blinking cursor indicates that you can change its setting.



Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 35.

Press the F2 key to change SPEED.

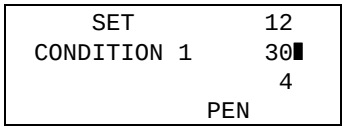
Press the F3 key to change QUALITY.

Press the ENTER key to register your setting.

To Change the Pen Speed

F2/SPEED

Press the F2 key to change SPEED. A blinking cursor indicates that you can change its setting.



△▽

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 90 and +. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, +.]
The "+" is 126cm/sec speed.

NOTE: The "+" selection is available with firmware version 1.13 or later.

F1/FORCE

Press the F1 key to change FORCE.

F3/QUALITY

Press the F3 key to change QUALITY.

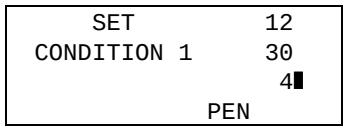
↵

Press the ENTER key to register your setting.

To Change the Pen Quality

F3/QUALITY

Press the F3 key to change QUALITY. A blinking cursor indicates that you can change its setting.



△▽

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality.

F1/FORCE

Press the F1 key to change FORCE.

F2/SPEED

Press the F2 key to change SPEED.

↵

Press the ENTER key to register your setting.

Pounce Conditions

To change the setting of a group of conditions, press the function key [F1] to [F4] corresponding to the number of the group you wish to change. For example, press the F3 key to select CONDITION 3.

Press the CONDITION key to get into the condition menu.

Press the NEXT key to cancel the condition where you are currently set and return to the main menu.

To Change the Pounce Force

Press the F1 key to change FORCE. The blinking cursor indicates that you can change its setting.

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 35.

Press the F3 key to change QUALITY.

Press the F4 key to change OFFSET.

Press the ENTER key to register your setting.

```
    SET          17
CONDITION 3      30
                  4
          POUNCE  1
```

To Change the Pounce Speed

Press the F2 key to change SPEED. The blinking cursor indicates that you can change its setting.

Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 90 and +. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, +.]
The "+" is 126cm/sec speed.

```
    SET          17
CONDITION 3      30
                  4
          POUNCE  1
```

NOTE: The "+" selection is available with firmware version 1.13 or later.

Press the F1 key to change FORCE.

Press the F3 key to change QUALITY.

Press the F4 key to change OFFSET.

Press the ENTER key to register your setting.

To Change the Pounce Quality

F3/QUALITY — Press the F3 key to change QUALITY. The blinking cursor indicates that you can change its setting.

△▽ — Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality.

F1/FORCE — Press the F1 key to change FORCE.

F2/SPEED — Press the F2 key to change SPEED.

F4/OFFSET — Press the F4 key to change OFFSET.

↵ — Press the ENTER key to register your setting.

```
     SET          17
CONDITION 3       30
                   4
           POUNCE  1
```

To Change the Pounce Offset

F4/OFFSET — Press the F4 key to change OFFSET. The blinking cursor indicates that you can change its setting.

△▽ — Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 99.

↵ — Press the ENTER key to register your setting.

```
     SET          17
CONDITION 3       30
                   4
           POUNCE  1
```

NOTE: For the Pounce Condition, the Cutter Offset refers to the spacing between holes in mm units.

Light Pointer Conditions

The light pointer, which is embedded in the pen carriage, provides a means of pointing at certain positions on the media which are needed for performing such functions as AXIS ALIGNMENT and AREA. The light pointer is automatically activated when it is needed.

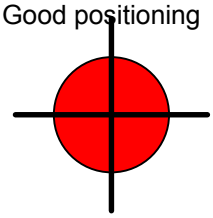
Since the light pointer has an offset from the pen, it moves to the position where the pen is currently located as soon as it is activated so that the position of the light point represents the position of the pen.

This light pointer can also be used to check the cutter path before cutting the contour of pre-printed images of such labels and stickers.

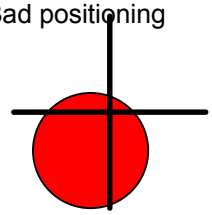
How to Point the Target

The light point is projected on the media as a small red circle. It allows you to see the position of the light point easily even though it is being placed on a large target. The target, usually printed on the media as cross lines, should be placed so that it is at the center of the circle as shown below.

Good positioning



Bad positioning



Checking the Cutter Path

Use the light pointer to verify the contour cut before actually cutting the job by selecting the light pointer as the tool and reducing the pen speed as low as possible so that you can see its path on the media.

Send the cut data to the plotter. The plotter runs the job with the LIGHT POINTER turning on and off to represent the PEN UP/DOWN status. The LIGHT POINTER is off to show when the PEN is UP. The LIGHT POINTER is on to show when the PEN is DOWN.

Changing Feed Speed

This function allows you to change the media feed speed from SLOW to NORMAL. In the case of selecting ROLL-1 and SHEET on the media type menu, the plotter uses SLOW to ensure the accuracy of the leading and trailing edges of the media. After the initialization, the feed speed can increase once the grit rollers and the pinch rollers secure the media. Always select SLOW for heavy media or media with a slippery surface otherwise select NORMAL to shorten the initialization time. Remember that the media will back up at the PEN UP SPEED when NORMAL is selected. For details see FEED – Advancing Media.

When the media set lever is lowered, the following menu appears on the display.

F4/OFFSET Press the F4 key.

```
     LOAD MEDIA!


       INITIAL MENU>
```

F3/QUALITY Press the F3 key to select INITIAL FEED SPEED.

```
     AUTO PRE FEED>
INITIAL FEED SPEED>
          INTERFACE>
```

F3/QUALITY Press the F3 key to select NORMAL.

F4/OFFSET Press the F4 key to select SLOW.

```
INITIAL FEED SPEED

              NORMAL*
                SLOW
```

Press the ENTER key to return to the previous menu.

Press the NEXT key to return to the previous menu.

F4/OFFSET Press the F4 key to set such parameters as STEP SIZE, RS232C CONDITIONS AND COMMANDS. ***For details see Setting the Interface Conditions.***

```
     AUTO PRE FEED>
INITIAL FEED SPEED>
          INTERFACE>
```

Raise the media set lever to engage the media.

The media type menu appears on the display, press key which corresponds to the type of media that is loaded for cutting/plotting.

```
              ROLL-1>
              ROLL-2>
               SHEET>
            CONTINUE>
```

F1/FORCE Press the F1 key to select ROLL-1.

F2/SPEED Press the F2 key to select ROLL-2.

F3/QUALITY Press the F3 key to select SHEET.

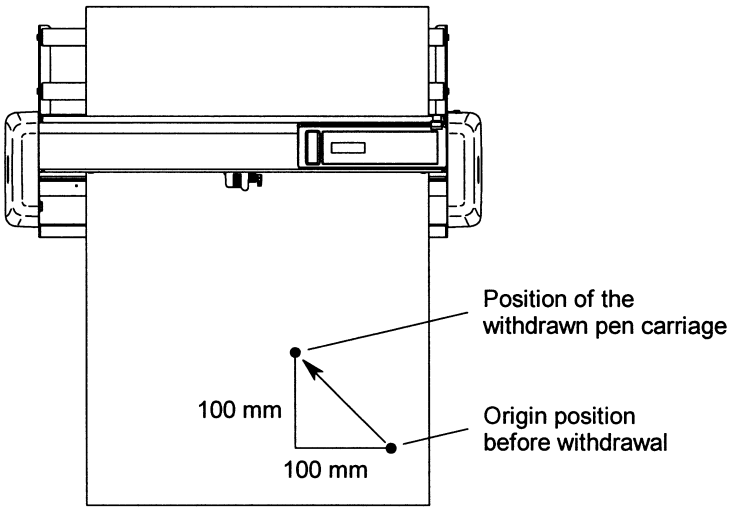
F4/OFFSET Press the F4 key to select CONTINUE.

Withdrawal of the Pen Carriage

This function moves the pen carriage from its current position to a position that is +100 mm away along both the X and Y axes. This also helps to confirm the job is completed.

While holding down the ENTER key, press the UP ARROW key.

Repeat this process as needed to move the pen carriage away from the cutting/plotting job.



Returning the Pen Carriage to Origin

This function moves the pen carriage from its current position to the origin point.

While holding down the ENTER key and press the DOWN ARROW key.

The pen carriage will return to the origin point.

Chapter 4 Advanced Functions and Settings

This chapter describes the advanced functions and settings for your cutter. Normally, you can access these functions through the menu however, some functions have quick keys on the control panel to provide fast access to these menus.

Control Panel Quick Keys

Origin – to set the cutting origin
Copy – to copy the data in the plotter's buffer memory
Condition – to set the cutter conditions, see ***Preparing to Cut***
Test – to test the cutter conditions, see ***Test Modes and Troubleshooting***
Axis Alignment -- to align pre-printed material for cutting, see ***Menu Controls***

Menu Controls

Pen UP/DOWN –to raise or lower the pen.
Buffer Clear – to clear the plotter's receiving buffer.
Feed – to feed the media before cutting when the cutting area is known
Interface
- Step Size – For more details, see ***Setting the Interface Functions***
- RS-232C – For more details, see ***Setting the Interface Functions***
- Command – For more details, see ***Setting the Interface Functions***

Area Parameters
- Origin – to set the Origin in HP-GL™ mode.
- Area – to specify the effective cutting area of the plotter.
- Expand – to expand the cut width instantly
- Page Length – to specify the length of individual pages when using roll media

Function 1
- Rotate – to rotate the coordinate axes by 90°
- Mirror – to cut a reverse image of the original data
- Scale – to enlarge or reduce an image

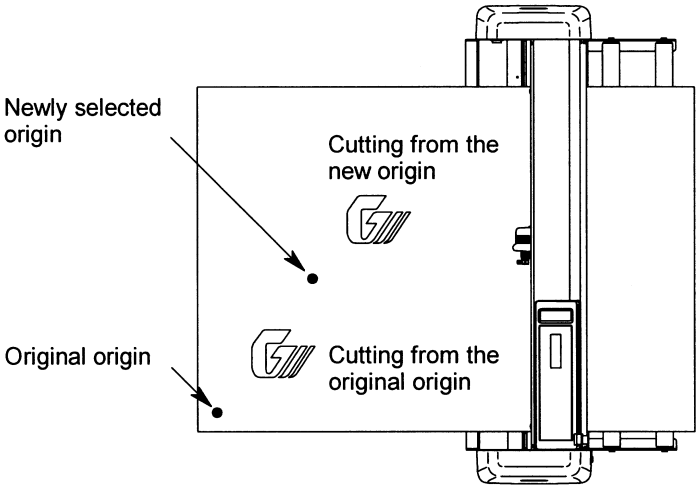
Function 2
- Data Sorting – to group the line segments
- Axis Alignment – to align pre-printed material for cutting
- Auto Pre Feed – to prevent slippage on large media jobs
- Tangent Emulation – to enable special blade control under special circumstances

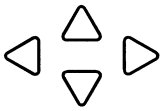
Option 1
- Pen Up Speed – to reduce overall cutting time
- Offset Angle – to smooth curves on large characters
- Offset Force – to control blade angle under special circumstances
- Step Pass – to smooth curves on small characters

Option 2
- Distance Adjust – to correct the distance distortion under special circumstances
- Test – For more details, see ***Test Modes and Troubleshooting***

ORIGIN - Setting the Cutting Origin

This function allows you to move the origin point of cutting.

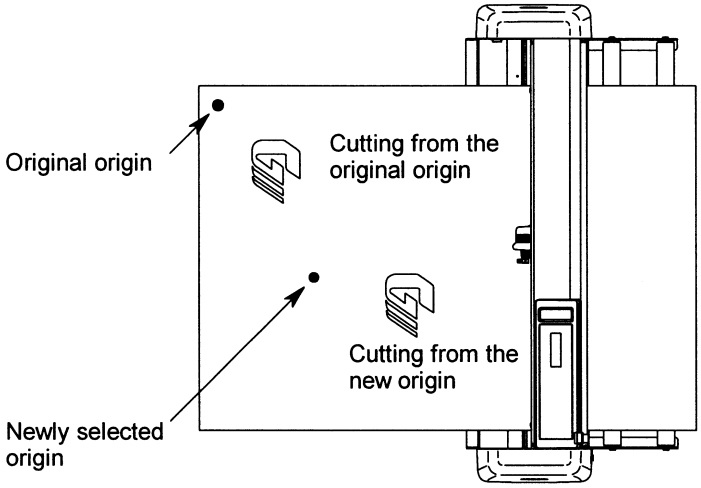




Use the UP, DOWN, RIGHT or LEFT ARROW keys to move the cutter to the desired origin position.

Press the ORIGIN key. The beeper sounds and the LCD displays a message indicating that the new origin is effective.

Origin Point with ROTATE function



NOTE: The coordinates being displayed represent displacements along the X and Y-axes from the original origin.

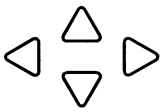
NOTE: If you intend to use the ORIGIN function in combination with the ROTATE or MIRROR function, be sure to set the ORIGIN function first.

COPY - Copying the Data in Plotter Buffer Memory

This function allows you to automatically cut duplicates of the data sent from the computer.

The data sent from the computer is always stored automatically in the plotter's receive buffer while it is cutting/plotting. Once the data has been stored in the plotter's receive buffer, it can be repeatedly cut by using this function.

CAUTION: While a copy operation is in process, do not send new data to the plotter.



Use the UP, DOWN, RIGHT or LEFT ARROW keys to move the cutter to the desired starting position for cutting, this is the Copy origin.

Press the COPY key to select the COPY mode.

If the data for copy is available in the receive buffer, the following menu will appear.

```
     COPY SPACE

           1 mm
```

If the receive buffer is empty the following message will appear. Return to the previous menu.
You need to re-send the data to the plotter.

```
  NO DATA FOR COPY

     IN BUFFER !
```

If one block of the data sent from the computer has exceeded the plotter's receive buffer size (1Mbyte), the following message will appear. Return to the previous menu.
You need to divide the data into smaller sizes or segments so that it can fit to the buffer, then re-send.

```
  BUFFER IS FULL

     CANNOT COPY !
```

Use the UP or DOWN ARROW key to increase or decrease the copy space after the COPY SPACE menu appear.

```
     COPY SPACE

           5 mm
```

Press the ENTER key to store setting.

If the effective cutting area is smaller than the area required to cut one copy, the following menu appears.

```
    CANNOT COPY
CUT AREA TOO SMALL

                  OK>
```

Press the F4 key to return to the start menu.

If the effective cutting area is available, the following menu appears.

```
     COPY MODE

  NUMBER OF COPIES
      [   1]
```

Use the UP or DOWN ARROW key to increase or decrease the number of copies.

The number can be increased up to the maximum number of copies that can be cut out of the currently loaded media.

You may re-load another larger media to achieve the number the copies you wish to cut. Then reset the copy function again.

↵ Press the ENTER key, the following menu will appear.

```
CONDITION 2     14
                30
    COPY         4
         CB09Ux  0
```

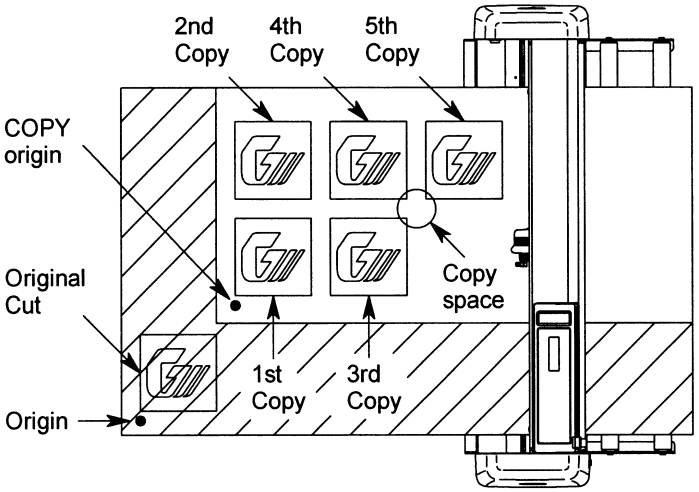
The plotter starts cutting/plotting as soon as the ENTER key is pressed.

If you wish to continue cutting more copies, reload the media and start over again from pressing the COPY key.

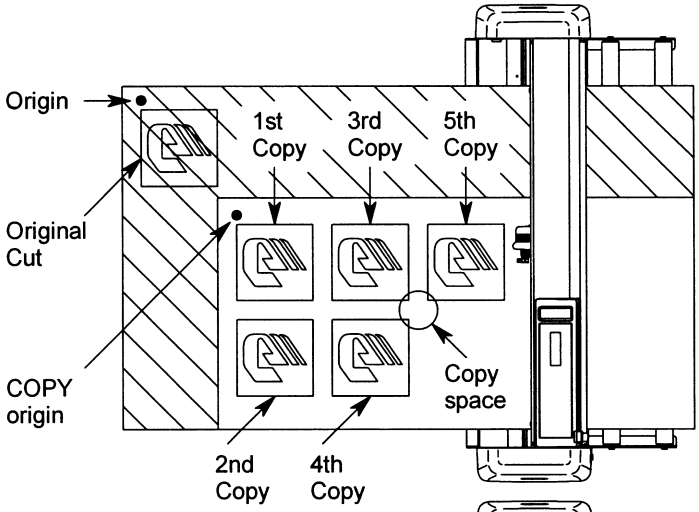
NOTE: If there is an interval of 10 seconds or greater when the data is sent, the previous data is cleared.

Copying Sequence

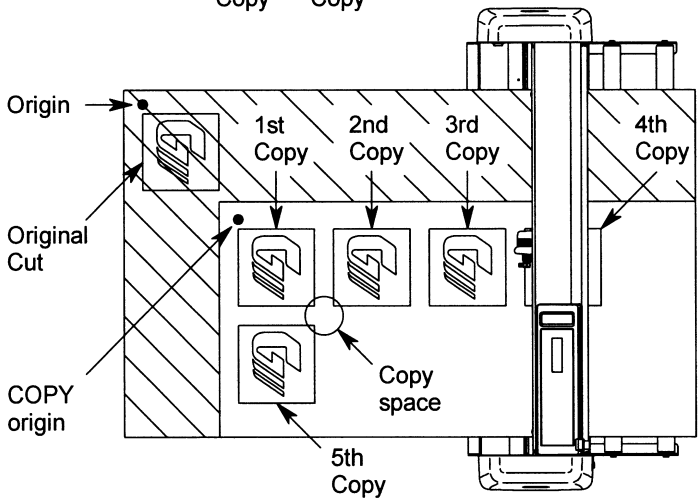
The following figures illustrate the sequence in which copies are cut, with the shaded areas representing the parts of the media that are not cut.



The copies are normally cut in this sequence.



If MIRROR mode is selected, the copies are cut in this sequence.



If ROTATE mode is selected, the copies are cut in this sequence.

PEN UP/DOWN - Raising/Lowering the Pen

The PEN UP/DOWN function allows you to raise or lower the pen from the control panel. When the light pointer is selected as the tool, this function controls the light pointer's light. The light turns on when PEN DOWN is selected. The light turns off when PEN UP is selected.

WARNING: While using this function, keep your hands out of the vicinity of the pen holder (especially the pen).

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the F2 key to toggle between PEN UP and PEN DOWN. The Pen UP/DOWN message does not change, but the pen will move up or down.

```
PEN UP/DOWN>
BUFFER CLEAR>
FEED>
```

Press the MENU key to cancel MENU mode.

BUFFER CLEAR - Clearing the Buffer

The BUFFER CLEAR function is used to clear from the plotter's receive buffer all data that has been sent from the computer.

WARNING: Do not execute the BUFFER CLEAR function until the computer has completed data output. If you clear the buffer while the computer is still sending data to the plotter, the data received up to the time that MENU mode was selected is cleared but the computer resumes sending subsequent data which remains in its buffer. At such time, the pen carriage may suddenly start moving so be sure to keep your hands, face and other obstacles out of the vicinity of the cutting mat and media.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the F3 key to select BUFFER CLEAR

```
        PEN UP/DOWN>
      BUFFER CLEAR>
              FEED>
```

The NOTE message then prompts you to stop sending data from the computer before clearing the buffer. If you wish to quit the current job, then cancel the current plotting on the application software.

Press the F3 key to clear the buffer

Press the F4 key to resume the cutting/plotting job.

```
BUFFER CLEAR OK?

              CLEAR>
             CANCEL>
```

If the F3 key is pressed, the following menu appears, then clearing buffer finishes.

```
 CLEARING BUFFER!

   PLEASE WAIT
```

```
    BUFFER CLEAR

     COMPLETED!
```

Press the MENU key to cancel MENU mode.

FEED - Advancing the Media

The FEED function is used to prevent the loaded media from slipping by automatically advancing the media to impress the media with grit roller marks, then returning the media to its original position.

If you are aware of how long media is going to be used for the next cutting, advance the media prior to starting cutting by this function. Otherwise enable AUTO PRE FEED FUNCTION.

CAUTION: Do not use the FEED function with media that is shorter than 1 meter. If the FEED LENGTH setting exceeds the actual length of loaded media, the media will fall out in front of the plotter. If this happens, shorten the FEED LENGTH.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the F4 key to select FEED.

```
PEN UP/DOWN>
BUFFER CLEAR>
FEED>
```

Press the UP and DOWN ARROW keys to get desired FEED LENGTH.

```
FEED LENGTH

1 m
```

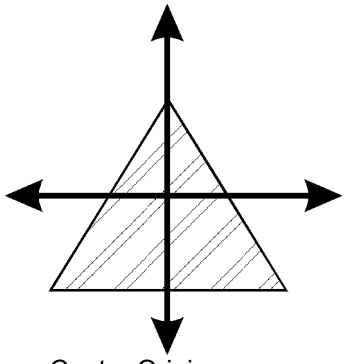
Press the ENTER key to register your settings.

The plotter starts feeding as soon as the ENTER key is pressed.

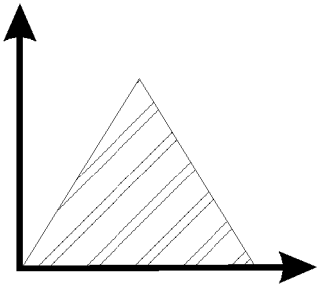
Press the MENU key to cancel MENU mode.

ORIGIN - Setting the Origin in HP-GL ä Mode

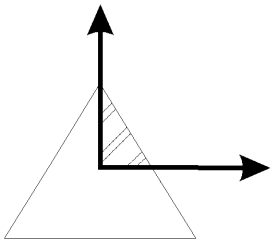
There are two types of origins; Center and Lower Left. If HP-GL™ uses the Center mode and the plotter uses the Lower Left Origin point you may lose plot data because it is out of the upper right quadrant. The ORIGIN mode allows you to alternate between both origin types in HP-GL™ mode.



Center Origin



Lower Left Origin



Designed in with Center Origin and plotted with a Lower Left Origin

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F2 key to select AREA PARAMETERS .

```
          INTERFACE>
AREA PARAMETERS>
       FUNCTION 1>
       FUNCTION 2>
```

Press the F1 key to select ORIGIN. If there is no ORIGIN in the menu, then the plotter is now in GP-GL mode. Change the mode, if necessary.

```
            ORIGIN>
              AREA>
            EXPAND>
       PAGE LENGTH>
```

Press the F3 key to select LOWER LEFT.

Press the F4 key to select CENTER.

```
ORIGIN POINT

      LOWER LEFT*
          CENTER
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your ORIGIN setting is retained in the plotter's internal memory even while the plotter is turned off. When the origin has been set to CENTER, the X- and Y- axis coordinate values shown on the display panel represent the respective distances from the lower left point of the effective cutting (plotting) range.

AREA - Setting the Cutting Area

The Upper Right (UR) and Lower Left (LL) functions are used to specify the effective cutting area of the plotter so that any data specifying coordinate positions outside of the effective cutting area are disregarded.

WARNING: As soon as both the LL and UR points are set, the pen carriage moves to the new origin. To avoid injury, keep your hands, face and other obstacles out of the vicinity of the cutting mat and media.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F2 key to select AREA PARAMETERS.

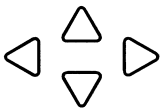
```
          INTERFACE>
AREA PARAMETERS>
      FUNCTION 1>
      FUNCTION 2>
```

Press the F2 key to select AREA. (ORIGIN in the 1st row appears in HP-GP mode only.)

```
            ORIGIN>
              AREA>
            EXPAND>
       PAGE LENGTH>
```

The following menu appears.

```
SET LOWER LEFT
   X=     0 mm
   Y=     0 mm
          DEFAULT>
```



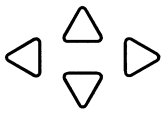
Use the POSITION Keys to specify a new LL position. At such time, the X= and Y= coordinate values respectively represent the current pen position as X- and Y-axis displacements from the original origin.

Press the ENTER key to register the newly specified LL Position.

Press the F4 key to select the DEFAULT if you wish to return to the original origin point.

Then the following menu appears.

```
SET UPPER RIGHT
   X=      0 mm
   Y=      0 mm
           DEFAULT>
```



Use the POSITION Keys to specify a new UR position. At such time, the X= and Y= coordinate values respectively represent the current pen position as X- and Y-axis displacements from the original origin.

Press the ENTER key to register the newly specified UR position.

Press the F4 key to select the DEFAULT if you wish to withdraw the current upper right setting so that the origin point returns to the original upper right point which is determined by loaded media size.

Press the MENU key to cancel MENU mode.

NOTE: When the plotter is initialized, your LL and UR settings are erased, and are initialized to their default position (the lower left and upper right corners of the maximum effective cutting area) unless CONTINUE is selected at the media type menu.

NOTE: The LL and UR positions cannot be specified outside of the actual area of the loaded media

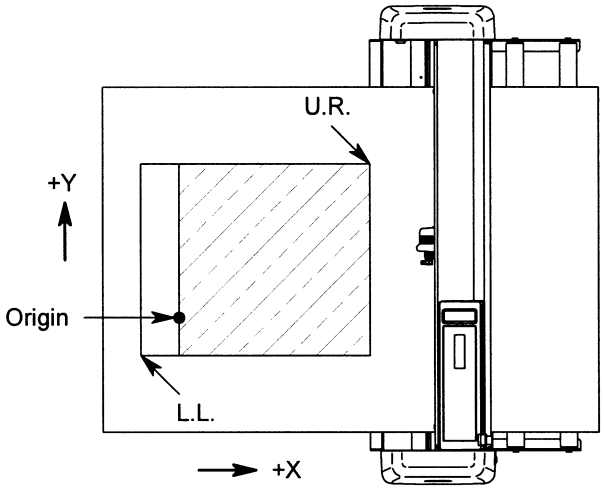
NOTE: The effective cutting area can only be set by specifying the lower left and upper right points. If the effective cutting area is incorrectly specified (for example, by specifying the Upper Left or Lower Right point or specifying the same point for both UR and LL positions), the message below appears for several seconds. In this case, reset the effective cutting area.

```
ILLEGAL PLOT AREA
```

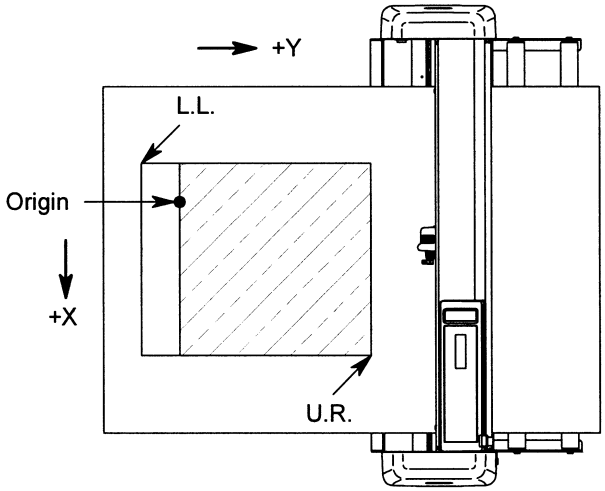
NOTE: When the ROTATE and MIRROR mode is selected or canceled after specifying new LL and UR positions, your LL and UR settings are initialized to their default positions.

NOTE: The effective cutting area cannot be specified past the origin in the direction of media feeding.

When the origin is set as shown in the example, the shaded area represents the effective cutting area defined by the LL and UR points.



When the ROTATE mode has been selected to rotate the coordinate axes by 90° as shown in the example, the shaded area represents the effective cutting area defined by the LL and UR points.



EXPAND - Expanding the Cut Area

EXPAND mode allows you to widen and narrow the cut area. The cut area is automatically determined by the position of the pinch rollers when the plotter is initialized.

Select EXPAND when cutting a pattern that is almost as wide as the media and you do not mind having the footprints of the grit rollers on the edges of the pattern. However, this function can be used to protect the cut pattern from the footprints by narrowing the cut area.

When the parameter of the EXPAND mode is set to zero (default), the limit of cut area is set at 1mm from the inside edge of the pinch roller tracks. The parameter of the EXPAND mode is ranges from -10 to +10 mm. This parameter represents the allow change of the limit position on each side of the cutting area.

A positive setting indicates the limit of both sides move toward the outside of the cutting area and a negative setting indicates the limit of both sides move toward the inside of the cutting area.

For example, setting at +5 gives 10mm wider cutting area than the size of the default cutting area where a setting at -5 gives a 10mm narrower cutting area than the default size.

CAUTION: In the case of setting the positive figure for the parameter, be sure to load the media on to the plotter accurately so that the media does not skew during cutting. The cutter blade may damage the cutting mat if the media skews.

CAUTION: In the case of setting +8 mm or more, be sure to set the Initial Blade Control Position as “2mm below”. The cutter blade will damage the cutting mat if it is set “OUTSIDE”. See ***Initial Blade Control Position*** in the ***Background Setting***.

NOTE: This function should be set before the cutting/plotting job is started since changing the setting of this mode causes the plotter’s initialization which in turn clears all the data in the buffer.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F2 key to select AREA PARAMETERS.

```
          INTERFACE>
AREA PARAMETERS>
       FUNCTION 1>
       FUNCTION 2>
```

Press the F3 key to select EXPAND. (ORIGIN in the 1st row appears in HP-GP mode only.)

```
          ORIGIN>
            AREA>
          EXPAND>
     PAGE LENGTH>
```

Press the UP or DOWN ARROW key to select the value.

```
SET EXPAND LIMIT

        0 mm
          DEFAULT>
```

Press the F4 key to select DEFAULT (0).

Press the ENTER key to store your setting, the following menu will appear.
If the F4 key is pressed, return to the previous menu.

```
  THIS OPERATION
RESETS THE PLOTTER!
          CONTINUE>
            CANCEL>
```

Press the F3 key to select CONTINUE.

Press the F4 key to select CANCEL.

If the CONTINUE is selected, the MEDIA TYPE MENU will appear. Select the media type you wish to use.

```
            ROLL-1>
            ROLL-2>
             SHEET>
```

Press the F1 key to select ROLL-1.

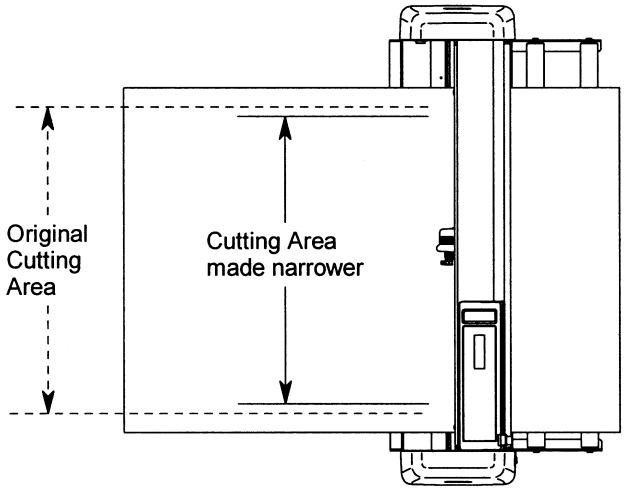
Press the F2 key to select ROLL-2.

Press the F3 key to select SHEET.

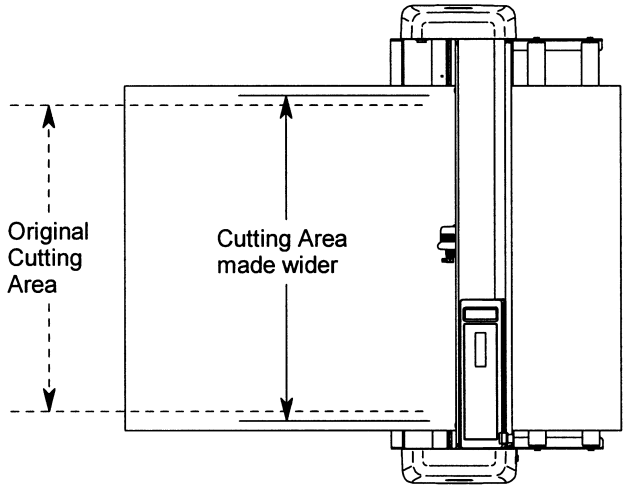
If the CANCEL is selected, return to the previous menu .

```
            ORIGIN>
              AREA>
            EXPAND>
       PAGE LENGTH>
```

Press the MENU key to cancel MENU mode.



Setting a negative expansion limit



Setting a positive expansion limit

PAGE LENGTH - Setting the Length of the Page with Roll Media

This function is used to specify the length of individual pages when using roll media.

CAUTION: For optimum precision, specify the PAGE LENGTH to 2 m or less.

CAUTION: When PAGE LENGTH is set over 2 m, be especially careful to load the media properly to prevent the media from coming loose from the rollers during cutting or plotting.

CAUTION: When using roll media or roll paper, be sure to pull out the entire amount of media required for the operation before you begin cutting or plotting unless the AUTO PRE FEED function is enabled.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F2 key to select AREA PARAMETERS.

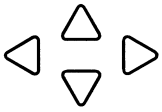
```
          INTERFACE>
AREA PARAMETERS>
      FUNCTION 1>
      FUNCTION 2>
```

Press the F4 key to select PAGE LENGTH. (ORIGIN in the 1st row appears in HP-GL™ mode only.)

```
            ORIGIN>
              AREA>
            EXPAND>
       PAGE LENGTH>
```

The page length menu appears.

```
PAGE LENGTH

L =  02000 mm
```



Press the LEFT or RIGHT ARROW key next to the blinking cursor to the next digit to the left or right. Press the UP or DOWN ARROW key to increase or decrease the L value.

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your PAGE LENGTH setting is retained in the plotter's internal memory even while the plotter is turned off. By specifying a long PAGE LENGTH, your plotter can perform long-axis plotting to produce banners of up to 50 m in length.

ROTATE - Rotating the Coordinate Axes

This function is used to move the origin and rotate the coordinate axes by 90° as shown in the figure below.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

F3/QUALITY — Press the F3 key to select FUNCTION1.

```
        INTERFACE >
AREA PARAMETERS>
     FUNCTION 1>
     FUNCTION 2>
```

F2/SPEED — Press the F2 key to select ROTATE.

```
            ROTATE>
            MIRROR>
             SCALE>
```

F3/QUALITY — Press the F3 key to turn ON the function .

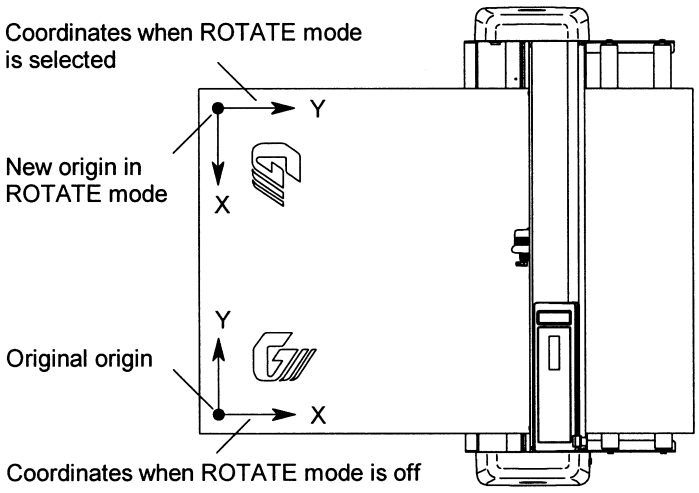
F4/OFFSET — Press the F4 key to turn OFF the function.

```
     ROTATE

              ON*
             OFF
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

When the ROTATE mode is selected or canceled, the displacement of the new origin remains valid in the “a” direction, but is reset to its default position in the “b” direction.



DATA SORTING - Sorting the cut data

DATA SORTING allows you to shorten the throughput time by minimizing the movements of the pen carriage and the media by means of sorting receiving data. In cases when the order of cut data from the application software is not well optimized, this function will increase throughput.

Use this function when the pen carriage and the media move back and forth excessively, and their movement is not minimized by the application software.

If your application software is able to efficiently manage the order of data, disable this function as it unnecessarily burdens the plotter's CPU.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F4 key to select FUNCTION 2.

```
          INTERFACE>
   AREA PARAMETERS>
        FUNCTION 1>
        FUNCTION 2>
```

Press the F1 key to select DATA SORTING.

```
      DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
TANGENT EMULATION>
```

Press the F3 key to select ENABLE.

Press the F4 key to select DISABLE.

```
   DATA SORTING

             ENABLE*
            DISABLE
```

Press the ENTER key to store your setting. If the F4 key is pressed, return to the previous menu.

```
      DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
TANGENT EMULATION>
```

If ENABLE is selected, the following menu will appear.

```
  THIS OPERATION
RESETS THE PLOTTER!
          CONTINUE>
            CANCEL>
```

Press the F3 key to select CONTINUE.

Press the F4 key to select CANCEL for the data sorting mode setting.

If CONTENU is selected, the MEDIA TYPE MENU then appears.
Select the media type you wish to use.

```
                ROLL-1>
                ROLL-2>
                 SHEET>
              CINTINUE>
```

F1/FORCE Press the F1 key to select ROLL-1.

F2/SPEED Press the F2 key to select ROLL-2.

F3/QUALITY Press the F3 key to select SHEET.

The following menu appear .
The plotter begins sorting immediately when it receives the cut data from the PC.

```
CONDITION 2     14
                30
 SORTING         4
         CB09UX  0
```

If CANCEL is selected, return to the previous menu .

```
       DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
TANGENT EMULATION>
```

Press the MENU key to cancel the menu mode.

NOTE: The plotter begins sorting immediately when it receives the cut data from the PC, however, the cutting/plotting may experience a delay due to the data sorting process. While the plotter is data sorting, following key operations become invalid.

Direct keys: COPY, ORIGIN, AXIS ALIGNMENT, CONDITION
F KEYS TO SELECTING CONDITION NUMBER

Menu mode: All the functions except for PEN UP/DOWN,
BUFFER CLEAR and FEED

NOTE: Your data sorting setting is retained in the plotter's internal memory even while the plotter is turned off.

MIRROR – Reversing the Image

To cut a reversed image of the original data, use the mirror mode. When the mirror mode is enabled, the origin and coordinate axes are changed as shown in the figure below. A mirror image of the original data is cut.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F3 key to select FUNCTION1.

```
          INTERFACE>
AREA PARAMETERS>
      FUNCTION 1>
      FUNCTION 2>
```

Press the F3 key to select MIRROR.

```
          ROTATE>
          MIRROR>
           SCALE>
```

Press the F3 key to turn ON the function.

Press the F4 key to turn OFF the function.

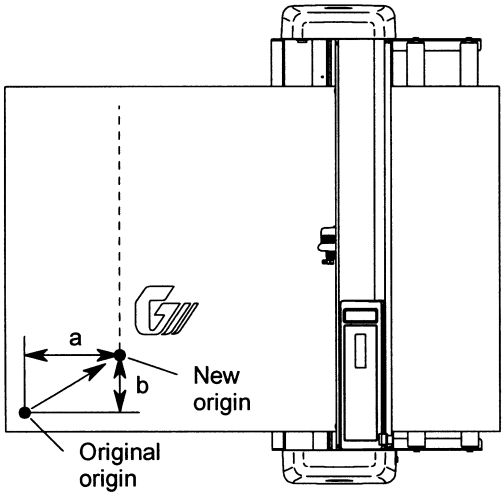
```
MIRROR

            ON*
           OFF
```

Press the ENTER key to register your settings.

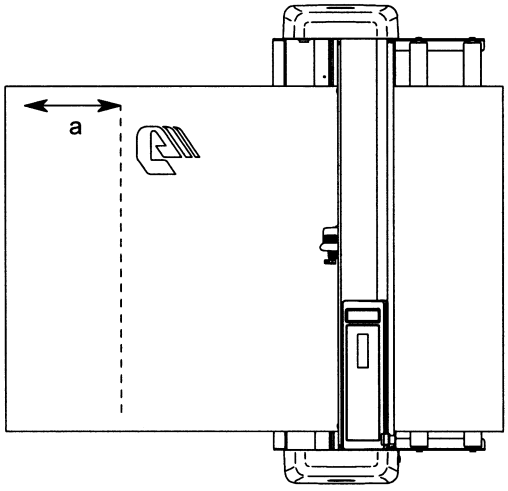
Press the MENU key to cancel MENU mode.

When the MIRROR mode is selected or canceled, the displacement of the new origin remains valid in the “a” direction, but is reset to its default position in the “b” direction.

Before MIRROR is selected



After MIRROR is selected



SCALE – Enlarging and Reducing an Image Size

This function sets the SCALE factor for enlarging or reducing an image to be cut or plotted.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F3 key to select FUNCTION 1.

```
          INTERFACE>
    AREA PARAMETERS>
         FUNCTION 1>
         FUNCTION 2>
```

Press the F4 key to select SCALE.

```
              ROTATE>
              MIRROR>
               SCALE>
```

Press the UP or DOWN ARROW keys to select the desired SCALE factor within the magnification range of 1/8, ¼, ½, 1, 2, 3, 4, 5, 6, 7, and 8.

```
       SCALE

SCALE FACTOR =  1
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

AXIS ALIGNMENT - Axis Alignment Parameter Setting

AXIS ALIGNMENT is a very important function that should be used when you intend to cut pre-printed media, such as stickers or decals. When the media is loaded in the plotter, the media should be loaded at exactly the same angle and position as it was on the printer which printed the images to ensure that the position of the contour matches the printed images. Since this can not be done manually, this function allows one to adjust the angle and position of the media on the plotter electrically as if it is being loaded on the same printer.

The direct key for AXIS ALIGNMENT is located on the operation panel so that you can rapidly access that function.

Axis Alignment parameters should be configured prior to performing the AXIS ALIGNMENT function. There are two main parameters: METHOD and TOOL

TOOL: There are two choices for the digitizing tool, LIGHT POINTER and LOUPE.

- LIGHT POINTER: Comes with the plotter's pen carriage and is the primary axis alignment tool.

- LOUPE: Is a pen shaped magnifier associated with a cross cursor (optional) referred to as "Bombsight". This option must be swapped with the cutter holder.

METHOD: There are two types of axis alignment methods, 2 points and 3 points. Each number represents the number of points, which will be digitized for the angle adjustment.

- 2 POINTS: This method should be used in cases where the printed media has two registration marks. This method is also applicable when there is one registration mark for origin point of the printing, and parallelism between the axis of the printed image and side edge of the media are guaranteed. For example in the case of the tractor feed printer, if the axis of printed image is parallel with the axis of media edge then a 2 points axis alignment can be performed. This is done by pointing at two different points on the edge of the media. The origin point can be set independently.

- 3 POINTS: This method should be used if the printed media has three registration marks. If the relative position of each of the three marks is already known, then the distortion of the printed image can be taken into account. The origin point can be set independently.

Selecting the Axis Alignment Tool

When the light pointer is selected and the AXIS ALIGNMENT key is pressed, the pen carriage and media move into position so that the light pointer is in the same position as the cutter/pen in READY mode. In this case, the position of the light pointer represents the position of the cutter/pen in READY mode.

If the loupe or bombsight has been selected, neither the pen carriage nor the media will move evenly, even though the AXIS ALIGNMENT key has been pressed because the loupe is already in the same position as the cutter/pen in READY mode. The light pointer does not light. If you are pointing to a registration mark colored with an illegible color such as red, use the loupe.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F4 key to select FUNCTION 2.

```
          INTERFACE>
  AREA PARAMETERS>
       FUNCTION 1>
       FUNCTION 2>
```

Press the F2 key to select AXIS ALIGNMENT.

```
     DATA SORTING>
  AXIS ALIGNMENT>
   AUTO PRE FEED>
TANGENT EMULATION>
```

Press the F4 key to select TOOL.

```
 AXIS ALIGNMENT

            METHOD>
              TOOL>
```

Press the F3 key to select the LIGHT POINTER.

Press the F4 key to select the LOUPE.

```
AXIS ALIGNMENT TOOL

       LIGHT POINT
            LOUPE*
```

Press the ENTER key to register your settings.

The following menu appears. If you wish to change another setting, press the key corresponding to that setting.

```
     DATA SORTING>
  AXIS ALIGNMENT>
   AUTO PRE FEED>
TANGENT EMULATION>
```

Press the MENU key to cancel MENU mode.

Selecting the Axis Alignment Method

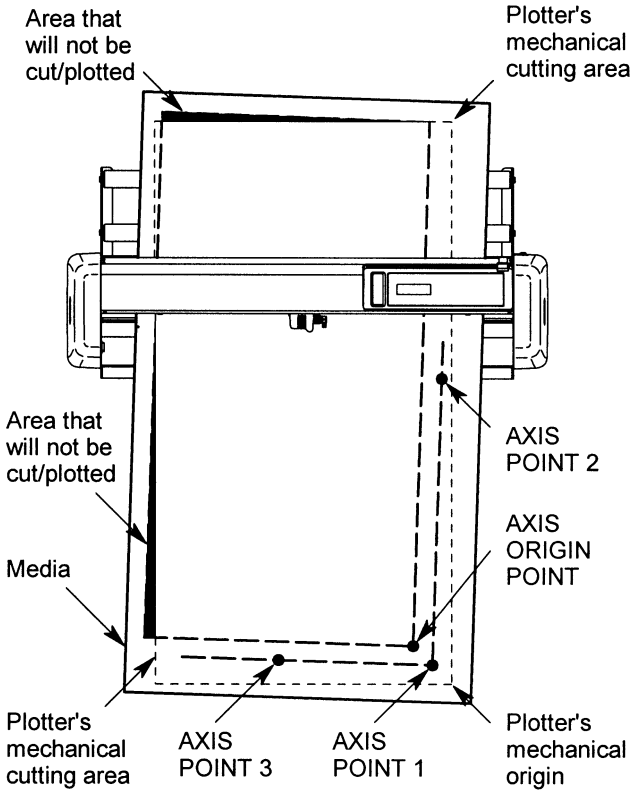
Two Point Method

The two point method requires you to enter “AXIS POINT 1”, “AXIS POINT 2” and the “AXIS ORIGIN POINT” which are shown at the bottom. The origin point may be located at the same position as that of point 1. The virtual angle of the X Axis and the position of the origin point can be adjusted individually.

Three Point Method

The three point method requires you to enter “AXIS POINT 1”, “AXIS POINT 2”, “AXIS POINT 3” and the “AXIS ORIGIN POINT” which are shown at bottom. The origin point may be located at the same position as that of point 1. You may adjust the virtual angle of both X and Y axes and the position of the origin point individually, as with the 2 point method and you may match the plotter’s distance scale to that of the printed image.

To match the plotter’s distance scale to that of the printed image the distance between point 1 and 2, point 1 and 3 must be known. This function helps when the dimensions of the printed image change during printing, laminating or storage.



AXIS POINT 1: Registration mark or any. In both methods, this point is commonly used as the reference for X and/or Y axis alignment.

AXIS POINT 2: Registration mark or any point on the line which goes through AXIS POINT 1 and along the X axis of the pre-printed image.

AXIS POINT 3: Registration mark or any point on the line which goes through AXIS POINT 1 and along the Y axis of the pre-printed image. This is only available when the Three Point Method is selected.

AXIS ORIGIN POINT: Origin point of pre-printed image.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F4 key to select FUNCTION 2.

```
          INTERFACE>
   AREA PARAMETERS>
        FUNCTION 1>
        FUNCTION 2>
```

Press the F2 key to select AXIS ALIGNMENT.

```
       DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
 TANGENT EMULATION>
```

Press the F3 key to select METHOD.

```
  AXIS ALIGNMENT

             METHOD>
               TOOL>
```

Press the F3 key to select 2 Point Method.

Press the F4 key to select 3 Point Method.

```
AXIS ALIGNMENT
METHOD
           2 POINTS*
           3 POINTS
```

Press the ENTER key to register your settings.

The following menu appears. If you wish to change another setting, press the key corresponding to that setting.

```
       DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
 TANGENT EMULATION>
```

Press the MENU key to cancel MENU mode.

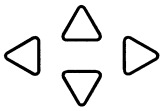
Axis Alignment Adjustment

When the light pointer is selected and the AXIS ALIGNMENT key is pressed, the pen carriage and media move into position so that the light pointer is in the same position as the cutter/pen in READY mode. In this case, the position of the light pointer represents the position of the cutter/pen in READY mode.

If the loupe or bombsight has been selected, neither the pen carriage nor the media will move evenly, even though the AXIS ALIGNMENT key has been pressed because the loupe is already in the same position as the cutter/pen in READY mode. The light pointer does not light. If you are pointing to a registration mark colored with an illegible color such as red, use the loupe.

Press the ALIGNMENT key to select the Axis Alignment mode.
Then the Axis Alignment menu appears.

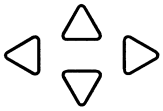
```
AXIS POINT  1

  X=      0 mm
  Y=      0 mm
```



Press the POSITION key to move the light pointer or the loupe to the Axis Point 1.

```
AXIS POINT  1

  X=+    10 mm
  Y=+     8 mm
```

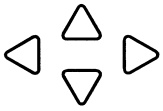
Press the ENTER key to store the setting.
The following menu appears.



Press the POSITION key to move the light pointer or the loupe to the Axis Point 2.

```
AXIS POINT  2

  X=+  410 mm
  Y=+    9 mm
```

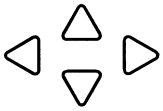
Press the ENTER key to store the setting.
If select the two point method, the Axis Origin Point menu appears. If you select the three point method, the Axis Point 3 menu appears.



Press the POSITION key to move the light pointer or the loupe to the Axis Point 3.

```
AXIS POINT  3

  X=+    9 mm
  Y=+  408 mm
```

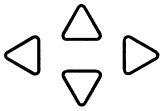
Press the ENTER key to store the setting.
The following menu appears.



If the distance between point 1 and point 2 is unknown press ENTER key to skip to the next step.
If the distance between point 1 and point 2 is known value, use the POSITION key to change the distance value to that of the printed image the distance between point 1 and point 2. The measured distance shown on the 3rd row. Set the actual distance on the 4th row.
Press the RIGHT or LEFT ARROW key to move the cursor.
Press the UP or DOWN key to increase or decrease the number of distance value.

```
DISTANCE
POINT 1-2
          00399.6 mm
OK?       00400.0 mm
```

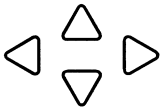
Press the ENTER key to store the setting.
The following menu appears.



Use the POSITION key to change the distance value to that of the printed image the distance between point 1 and point 3.
Press the RIGHT or LEFT ARROW key to move the cursor.
Press the UP or DOWN key to increase or decrease the number of distance value.

```
DISTANCE
POINT 1-3
          00399.6 mm
OK?       00400.0 mm
```

Press the ENTER key to store the setting.
The following menu appears.



The light pointer or the loupe move back to the Axis Point 1.
If the Axis Point 1 is not the origin point of the pre-printed image, press the POSITION key to move the light pointer or the loupe to the desired origin point for cutting.
If the Axis Point 1 is the origin point of the pre-printed image, press the ENTER key.

```
  AXIS ORIGIN POINT

     X=       mm
     Y=       mm
```

Then press the ENTER key to store the setting.

The READY menu appears, the plotter is ready to start the cutting operation.

```
  CONDITION 2    14
                 30
    READY         4
          CB09Ux 0
```

AUTO PRE FEED - Advancing the Media Automatically

The auto pre feed function is used to prevent the loaded media from slipping caused by the impact from pulling the media out from the stock roll during cutting/plotting.

If this function is enabled, the plotter begins feeding as soon as initializing finishes. During cutting/plotting, the plotter stops its job if the next cut/plot data goes beyond the length that has been pulled out from the stock roll. Next, feed the media length in accordance with the Feed Length setting, then resume the cutting/plotting job.

Please note that this function should be set before the cutting/plotting job is started since changing the setting of this mode leads to the plotter's initialization, as well as clears all the data to continue the suspended job in the buffer.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F4 key to select FUNCTION 2 .

```
          INTERFACE>
   AREA PARAMETERS>
        FUNCTION 1>
        FUNCTION 2>
```

Press the F3 key to select AUTO PRE FEED .

```
      DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
TANGENT EMULATION>
```

Press the F3 key to select ENABLED .

Press the F4 key to select DISABLED.

```
  AUTO PRE FEED

           ENABLED*
          DISABLED
```

Press the ENTER key to store the selecting.

If the F3 key is pressed, the following menu appear.

```
  AUTO PRE FEED

FEED LENGH=   1 m
```

Press the UP or DOWN ARROW to increase or shorten FEED LENGTH. The menu will cycle through the available lengths in sequence.
The FEED LENGTH can be set in a range of 1 to 50 meters. When a feed length is set too high, the media will unwind. Unwound media will not cut as easily as wound media.

Press the ENTER key to store the setting.

Press the MENU key to cancel MENU mode.

NOTE: The plotter begins pre-feeding as soon as the cutting data is sent from the PC when the auto pre-feed is enabled AND the new origin point is within 50mm of the previous feed's border.

You may access the Auto pre-feed menu from the initial menu, which appears on the LCD when the paper set lever is lowered.

```
     LOAD MEDIA!


       INITIAL MENU>
```

F4/OFFSET

Press the F4 key to select the initial menu while the initial menu appears on the LCD.

F2/SPEED

Press the F2 key to select the AUTO PRE FEED.

```
     AUTO PRE FEED>
INITIAL FEED SPEED>
          INTERFACE>
```

F3/QUALITY

Press the F3 key to select ENABLED .

F4/OFFSET

Press the F4 key to select DISABLED.

```
  AUTO PRE FEED

            ENABLED*
           DISABLED
```

If the F3 key is pressed, the following menu appear.

```
  AUTO PRE FEED

FEED LENGH=   1 m
```

Press the UP or DOWN ARROW to increase or shorten FEED LENGTH. The menu will cycle through the available lengths in sequence.

Press the ENTER key to store the setting. The following menu appear.

```
     AUTO PRE FEED>
INITIAL FEED SPEED>
          INTERFACE>
```

Press the NEXT key.

The LOAD MEDIA message then appears again. Mount the media and raise the media set lever.

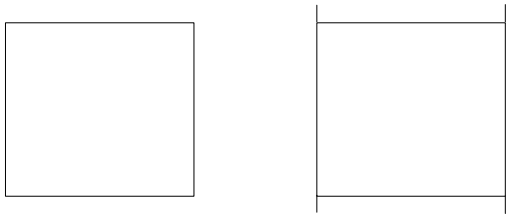
```
     LOAD MEDIA!


       INITIAL MENU>
```

TANGENTIAL EMULATION - Cutting Tiny Letters or Thick & Thin Material

The tangential emulation blade control prevents the following problems from occurring in the normal blade control.

- Dull corner shapes on thick material.
- Inadequate line length particularly on thick material.
- Broken corners on thick and thin material.

When the tangential emulation is enabled a special blade rotation control and cut pressure control are performed at the turning points, such as corners, to ensure a quality cut. An overcut function, which eliminates uncut portions from thick material is available when the tangential emulation is enabled.



Be sure to set TANGENTIAL settings to suit the media being cut.

Selecting Tangential Emulation Mode

There are two modes available for the tangential emulation control, MODE1 and MODE2. MODE 1 has the best overall quality. Mode 2 has the best overall time. If the cutting/plotting performance is too slow due to excessive up/down pen movements, then select MODE2 to shorten the cut/plot time. Remember that the cutting quality with MODE 2 is inferior to that of MODE1.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F4 key to select FUNCTION 2.

```
          INTERFACE>
   AREA PARAMETERS>
        FUNCTION 1>
        FUNCTION 2>
```

Press F4 key to select TANGENT EMULATION.

```
      DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
TANGENT EMULATION>
```

Press F3 key to select mode.

```
TANGENTIAL
EMULATION
             MODE>
 ENABLE/DISABLE>
```

Press the F3 key to select MODE 1.

```
TANGENTIAL
EMULATION
          MODE 1>
          MODE 2>
```

Press the F4 key to select MODE 2.

Press the ENTER key to register your setting.

Press the MENU key to cancel MENU mode.

Enabling the Tangential Emulation

Tangential emulation control can be individually enabled or disabled by pen condition.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the F4 key to select FUNCTION 2 .

```
          INTERFACE>
   AREA PARAMETERS>
        FUNCTION 1>
        FUNCTION 2>
```

Press the F4 key to select TANGENT EMULATION .

```
       DATA SORTING>
    AXIS ALIGNMENT>
     AUTO PRE FEED>
TANGENT EMULATION>
```

Press the F4 key to toggle between ENABLE/DISABLE.

```
 TANGENTIAL
 EMULATION
                MODE>
    ENABLE/DISABLE>
```

Press the [F1] key to [F4] key as required to enable/disable the tangential emulation mode per each condition of numbers.

```
TANGENTIAL    OFF-1
EMULATION     OFF-2
              OFF-3
              OFF-4
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

In READY status, the message TANGENTIAL appears along with the condition menu when the condition on which the enabled tangential emulation is selected .

```
 CONDITION 2     14
                 30
READY TANGENTIAL  4
          CB09Ux  0
```

SPEED - Setting the Pen Up Speed

To reduce the overall cutting time, this function allows you to set the traveling speed of the pen in raised status, separately from the cutting SPEED setting.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F3 key to select OPTION 1.

```
                    OPTION 1>
                    OPTION 2>
```

Press the F1 key to select PEN UP SPEED.

```
          PEN UP SPEED>
          OFFSET ANGLE>
          OFFSET FORCE>
             STEP PASS>
```

Press the UP or DOWN ARROW key to sequence through the available choices.
The PEN UP SPEED can be set to AUTO or to 10, 20, 30, 40, 50 or 60 cm/s. When AUTO is selected the PEN UP SPEED is set to match the current cutting SPEED setting.

```
    PEN UP SPEED

    SPEED= AUTO
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your PEN UP SPEED setting is retained in the plotter's internal memory even while the plotter is turned off.

OFFSET ANGLE - Adjusting the Blade Offset Angle

Use this function to smooth curves on large characters or shapes. At the joints of each line segment, the plotter stops cutting and very quickly rotates the blade tip. This ensures the accurate cutting of the computer data. In some cases, it is better to bypass this blade rotation and drag the blade in order to make the shape smoother and to shorten overall cutting time. This action will result in a slightly different shape from the original computer data.

With this OFFSET ANGLE function, you may set the reference angle of connection, and eliminate the blade control at the connections whose angles are under that reference angle.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F3 key to select OPTION 1.

```
                OPTION 1>
                OPTION 2>
```

Press the F2 key to select OFFSET ANGLE.

```
          PEN UP SPEED>
          OFFSET ANGLE>
          OFFSET FORCE>
             STEP PASS>
```

Press the UP or DOWN ARROW key to sequence through the available choices.
The OFFSET ANGLE can be set in a 61-step range from 0 to 60.

```
      OFFSET ANGLE

       ANGLE =  30
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your OFFSET ANGLE setting is retained in the plotter's internal memory even when the plotter is turned off.

NOTE: Excessive settings may deform the shape of characters. Be sure to perform adequate testing before performing your final cut to ensure that you have located the appropriate setting which offers the proper quality.

OFFSET FORCE - Setting the Offset Cut Pressure

Since the direction in which the blade tip is facing cannot be determined during initialization of the plotter, initial blade control is performed to adjust the offset angle of the blade (See OFFSET FORCE - Adjusting the Blade Offset Angle).

The Offset Cut Pressure function is used to specify the force applied during initial blade control.

The Offset Cut Pressure is also used to offset the blade angle in TANGENTIAL EMULATION MODE. This pressure should be set as low as possible to ensure cutting quality. If the pressure is too great the corners may break or lack a clear cut, particularly when using very thin material. Start from the default setting (4) first, then change the value if necessary.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F3 key to select OPTION 1.

```
                OPTION 1>
                OPTION 2>
```

Press the F3 key to select OFFSET FORCE.

```
          PEN UP SPEED>
          OFFSET ANGLE>
          OFFSET FORCE>
             STEP PASS>
```

Press the UP ARROW or DOWN AROW key to sequence through the available choices.
The OFFSET PRESSURE can be set in a 35-step range from 1 to 35.

```
     OFFSET FORCE

       FORCE =  4
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your OFFSET PRESSURE setting is retained in the plotter's internal memory when the plotter is turned off.

NOTE: The OFFSET PRESSURE setting specifies the pressure being applied during initial blade control and during offset control in TANGENTIAL EMULATION MODE. This is separate from the cutting force setting which specifies the down force of the lowered cutter pen during cutting.

STEP PASS - Setting the Step Pass

Use this function when the cut line is jagged in detailed shapes such as small characters with tiny curves. The jaggedness is caused by an excessive number of line segments for small characters. It also slows the cutting speed.

Use this function to skip or PASS some of the STEPS, make the line smoother and to accelerate the cutting time.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F3 key to select OPTION 1.

```
                OPTION 1>
                OPTION 2>
```

Press the F4 key to select STEP PASS.

```
          PEN UP SPEED>
          OFFSET ANGLE>
          OFFSET FORCE>
             STEP PASS>
```

Press the UP or DOWN ARROW key to sequence through the available choices.
The STEP PASS can be set in a 21-step range from 0 to 20. The higher the number, the more steps of data will be passed between each data point. These data points represent actual cut line segments.

```
       STEP PASS

    STEP PASS  = 0
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your STEP PASS setting is retained in the plotter's internal memory even when the plotter is turned off.

NOTE: Excess settings may deform the shape of characters, therefore this value should be kept at zero if it is not needed. Always perform a cut test to verify the settings.

DISTANCE ADJUST - Adjusting the Length of Cut Line Segments

The actual length of cut line segments may vary according to the thickness of the media being used. In this case, use the DISTANCE ADJUST function to correct the distance.

Each of the DISTANCE ADJUST settings represent a percentage of two meter distance along the X or Y-axis. Consequently, setting the DISTANCE AJUST Setting for the X-axis to +0.5% increases the X-axis by 1 mm.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F4 key to select OPTION 2.

```
                OPTION 1>
                OPTION 2>
```

Press the F3 key to select DISTANCE ADJUST .

```
     DISTANCE ADJUST>
                TEST>
```

Press the F2 key to correct the X-axis distance.

Press the F3 key to correct the Y-axis distance.

Press the F4 key to select RESET.

```
  DISTANCE ADJUST
              X 0.00%
              Y 0.00%
                RESET>
```

Press the UP or DOWN ARROW key to sequence through the available choices.
Each value can be set in a range of -2.00% to +2.00% in 0.05% steps.

```
  DISTANCE ADJUST
              X+2.00%
              Y-2.00%
                RESET>
```

Press the ENTER key to register your settings.

Press the MENU key to cancel MENU mode.

NOTE: Your DISTANCE CORRECTION setting is retained in the plotter's internal memory even when the plotter is turned off.

Chapter 5 Background Settings

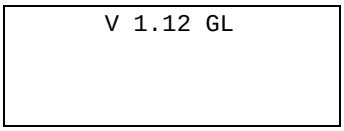
This chapter discusses your plotter's background settings.

NOTE: Your settings are registered in the plotter's internal memory and retained even when the plotter is turned off.

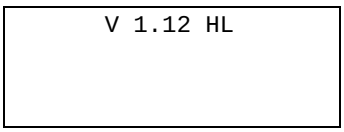
To access this menu, turn on the plotter while pressing the DOWN ARROW key. After setting the necessary items, turn off the plotter regardless of the menu being displayed. All settings are registered in the plotter's internal memory and retained even when the plotter is turned off.

There are two different menu sequences. Each of them belongs to GP-GL and HP-GL commands.

This menu sequence comes up if GP-GL is selected as the plotter's data command.

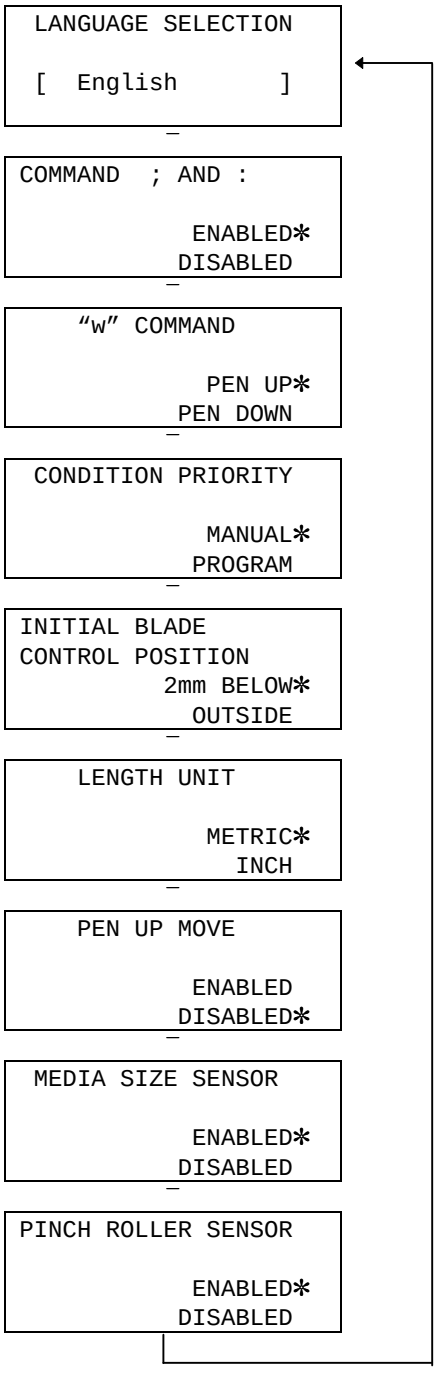


This menu sequence comes up if HP-GL is selected as the plotter's data command.

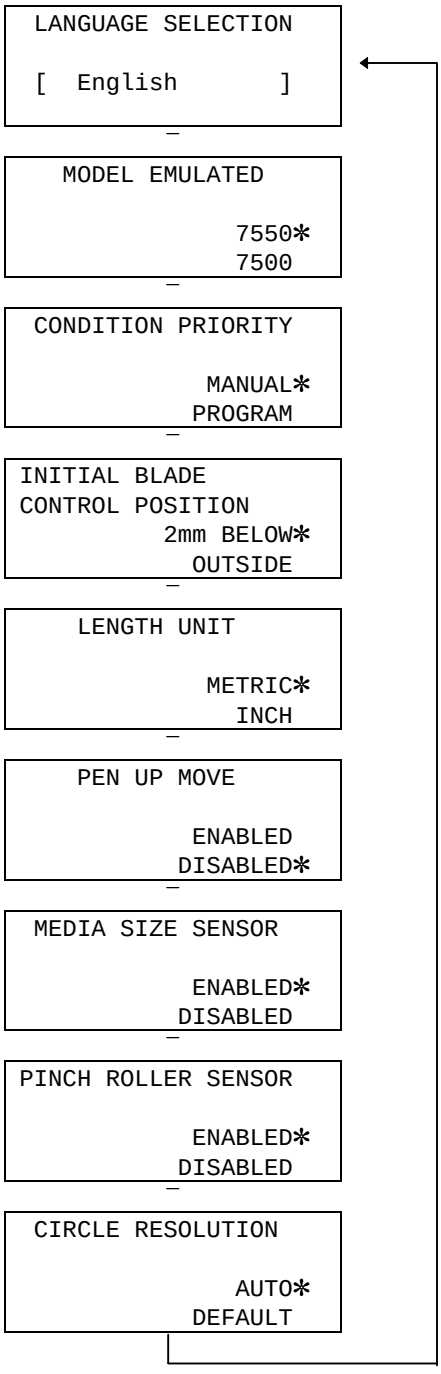


The MENU TREE of Background Setting

GP-GL
Background Settings



HP-GL ™
Background Settings



Background Settings for GP-GL

LANGUAGE SELECTION

You may select one of the following 12 languages for the operation menu: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish.

Press the UP and DOWN ARROW keys to select the desired language.

```
LANGUAGE SELECTION

[  English       ]
```

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
COMMAND  ; AND :

             ENABLED*
            DISABLED
```

If you do not wish to make any changes on the background settings, turn off the plotter.

":" ";" Command Control (":" ";" COMMAND)

When the GP-GL command mode is selected, set this function to enable or disable the recognition of ":" and ";" commands set from the computer.

These commands may adversely affect the cutting results if the leading section of data is missing. In such cases, set this function to DISABLED.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice.

```
COMMAND  ; AND :

             ENABLED*
            DISABLED
```

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
   "w" COMMAND

             PEN UP*
            PEN DOWN
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Pen UP/DOWN for the "W" Command

When a command specifying the plotting of an arc is sent from the computer, this function determines whether to raise the pen or leave it in the same status (for example, the pen remains lowered if it was lowered when the command was received) before moving it to the starting position for plotting.

When PEN DOWN is selected, the pen is moved to the starting position in the same status.

When PEN UP is selected, the pen is raised before moving to the starting position. These settings are effective on cutting mode only.

Press the F3 key to select PEN UP.

Press the F4 key to select PEN DOWN.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
   "w"   COMMAND

           PEN UP*
         PEN DOWN
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
CONDITION PRIORITY

            MANUAL*
           PROGRAM
```

Condition Priority

This function determines the priority of programmed cutting conditions and manual settings of cutting conditions at the plotter's control panel.

When MANUAL is selected, commands specifying cutting conditions from the computer are ignored and the cutting conditions can only be set at the control panel. The registered conditions are retained in the plotter's internal memory even while the plotter is turned off.

When PROGRAM is selected, the cutting conditions can be set either at the plotter's control panel or by command input from the computer. When the plotter is turned off, however, the registered conditions are not retained.

Press the F3 key to select MANUAL.

Press the F4 key to select PROGRAM.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
CONDITION PRIORITY

            MANUAL*
           PROGRAM
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
INITIAL BLADE
CONTROL POSITION
          2mm BELOW*
            OUTSIDE
```

Initial Blade Control Position (INIT. BLADE CONTROL)

This function specifies the position at which initial blade control is performed (for more information about initial blade control see ***Adjusting the Blade Offset Angle***.)

When 2 mm BELOW is selected, initial blade control is performed 2 mm below the starting point of cutting.

When OUTSIDE is selected, initial blade control is performed outside of the effective cutting area.

Press the F3 key to select 2 mm BELOW.

Press the F4 key to select OUTSIDE.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
INITIAL BLADE
CONTROL POSITION
          2mm BELOW*
            OUTSIDE
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
    LENGTH UNIT

              METRIC*
                INCH
```

Length Unit

This selection enables one to set the unit for coordinates appearing on the display panel to either units of millimeters or inches.

Press the F3 key to select METRIC.

Press the F4 key to select INCH.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
    LENGTH UNIT

              METRIC*
                INCH
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
    PEN UP MOVE

             ENABLED
            DISABLED*
```

Pen UP Movement Control (PEN UP MOVE)

When the Plotter receives commands that specify consecutive pen movements in raised status, the PEN UP MOVE function determines whether to move the pen to each coordinate point or to move the pen directly to the final coordinate point.

When ENABLED is selected, the pen moves to each coordinate point in sequence.

When DISABLED is selected, the pen moves directly to the final coordinate point.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
   PEN UP MOVE

            ENABLED
           DISABLED*
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
MEDIA SIZE SENSOR

            ENABLED*
           DISABLED
```

Media Size Sensor Control

This function allows you to disable the media length sensor function which is performed after selecting the media type during the plotter's initialization.

When ENABLED is selected, the media length sensor is performed.

When DISABLED is selected, the media length sensor will not perform.

In cases where the media length is disabled, the pen carriage may go beyond the edge of the media. Always set the AREA function to limit the cut area and protect the cutting mat from damage.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
MEDIA SIZE SENSOR

            ENABLED*
           DISABLED
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
PINCH ROLLER SENSOR

            ENABLED*
           DISABLED
```

Pinch Roller Sensor Control

This function allows you to disable the pinch roller position sensor function which is performed after selecting the media type during the plotter's initialization.

When ENABLED is selected, the pinch roller position sensor is performed.

When DISABLED is selected, the pinch roller position sensor will not perform.

In cases where the media length is disabled, the pen carriage may go beyond the edge of the media. Always set the AREA function to limit the cut area and to protect the cutting mat from damage.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
PINCH ROLLER SENSOR

            ENABLED*
           DISABLED
```

```
 LANGUAGE SELECTION

 [  English       ]
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Background Settings for HP-GL

LANGUAGE SELECTION

You may select one of the following 12 languages for the operation menu: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish.

Press the UP and DOWN ARROW keys to select the desired language.

```
LANGUAGE SELECTION

[  English       ]
```

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
  MODEL EMULATED

               7550*
               7500
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Model No. Response (MODEL EMULATED)

When the HP-GL™ command mode is selected, this function selects the plotter's response to an "OI" request sent from the computer.

When 7550 is selected, the plotter's response is 7550.

When 7500 is selected, the plotter's response is 7500.

Press the F3 key to select 7550.

Press the F4 key to select 7500.
An asterisk appears beside your choice.

```
  MODEL EMULATED

               7550*
               7500
```

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
CONDITION PRIORITY

              MANUAL*
             PROGRAM
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Condition Priority

This function determines the priority of programmed cutting conditions and manual settings of cutting conditions at the plotter's control panel.

When MANUAL is selected, commands specifying cutting conditions from the computer are ignored and the cutting conditions can only be set at the control panel. The registered conditions are retained in the plotter's internal memory even while the plotter is turned off.

When PROGRAM is selected, the cutting conditions can be set either at the plotter's control panel or by command input from the computer. When the plotter is turned off, however, the registered conditions are not retained.

Press the F3 key to select MANUAL.

Press the F4 key to select PROGRAM.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
CONDITION PRIORITY

              MANUAL*
              PROGRAM
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Initial Blade Control Position (INIT. BLADE CONTROL)

This function specifies the position at which initial blade control is performed (for more information about initial blade control see ***Adjusting the Blade Offset Angle***.)

When 2 mm BELOW is selected, initial blade control is performed 2 mm below the starting point of cutting.

When OUTSIDE is selected, initial blade control is performed outside of the effective cutting area.

Press the F3 key to select 2 mm BELOW.

Press the F4 key to select OUTSIDE.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
INITIAL BLADE
CONTROL POSITION
          2mm BELOW*
            OUTSIDE
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
    LENGTH UNIT

              METRIC*
                INCH
```

Length Unit

This selection enables one to set the unit for coordinates appearing on the display panel to either units of millimeters or inches.

Press the F3 key to select METRIC.

Press the F4 key to select INCH.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
LENGTH UNIT

          METRIC*
            INCH
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
PEN UP MOVE

           ENABLED
          DISABLED*
```

Pen UP Movement Control (PEN UP MOVE)

When the Plotter receives commands that specify consecutive pen movements in raised status, the PEN UP MOVE function determines whether to move the pen to each coordinate point or to move the pen directly to the final coordinate point.

When ENABLED is selected, the pen moves to each coordinate point in sequence.

When DISABLED is selected, the pen moves directly to the final coordinate point.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
PEN UP MOVE

           ENABLED
          DISABLED*
```

If you do not wish to make any changes on the background settings, turn off the plotter.

```
MEDIA SIZE SENSOR

           ENABLED*
          DISABLED
```

Media Size Sensor Control

This function allows you to disable the media length sensor function which is performed after selecting the media type during the plotter's initialization.

When ENABLED is selected, the media length sensor is performed.

When DISABLED is selected, the media length sensor will not perform.

In cases where the media length is disabled, the pen carriage may go beyond the edge of the media. Always set the AREA function to limit the cut area and protect the cutting mat from damage.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
MEDIA SIZE SENSOR

            ENABLED*
           DISABLED
```

```
PINCH ROLLER SENSOR

            ENABLED*
           DISABLED
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Pinch Roller Sensor Control

This function allows you to disable the pinch roller position sensor function which is performed after selecting the media type during the plotter's initialization.

When ENABLED is selected, the pinch roller position sensor is performed.

When DISABLED is selected, the pinch roller position sensor will not perform.

In cases where the media length is disabled, the pen carriage may go beyond the edge of the media. Always set the AREA function to limit the cut area and to protect the cutting mat from damage.

Press the F3 key to select ENABLED.

Press the F4 key to select DISABLED.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

```
PINCH ROLLER SENSOR

            ENABLED*
           DISABLED
```

```
CIRCLE RESOLUTION

              AUTO*
           DEFAULT
```

If you do not wish to make any changes on the background settings, turn off the plotter.

Circle Resolution

Use this selection to achieve smoother cut/plot quality on large circles or arcs when drawing with the circle or arc commands.

When AUTO is selected, the resolution of circles and arcs will be automatically optimized.

When DEFAULT is selected, the resolution of circles and arcs is always 5 degrees. If the circle or arc consists of short line segments, the quality of the circle or arc will not change by this setting.

Press the F3 key to select AUTO.

Press the F4 key to select DEFAULT.
An asterisk appears beside your choice.

Press the ENTER key to register your setting and to proceed to the next menu.

Press the NEXT key if you wish to bypass this setting with no changes.

If you do not wish to make any changes on the background settings, turn off the plotter.

```
CIRCLE RESOLUTION

                AUTO*
              DEFAULT
```

```
LANGUAGE SELECTION

[  English       ]
```

Chapter 6 Test Modes and Troubleshooting

This chapter describes the check points and possible solutions to use for troubleshooting if the plotter does not operate or operates abnormally.

CONDITION LIST - Listing the Cutting Conditions

The CONDITON LIST function allows you to print a list of the settings of the four groups of cutting conditions, so you can check all of your current settings at a glance.

WARNING: The pen starts moving as soon as the CONDITON PRINT function is selected. To avoid injury to yourself and damage to the plotter, keep your hands, face and other obstacles out to the vicinity of the cutting mat and paper.

CAUTION: Mounting the cutter pen for this mode may cause fatal damage to the cutting mat. Be sure to mount the plotter pen.

Load paper whose size is larger than either ISO (A4) or Letter size (11” x 8½”) and mount the plotter pen.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F4 key to select OPTION 2.

```
                OPTION 1>
                OPTION 2>
```

Press the F4 key to select TEST.

```
          DISTANCE ADJUST>
                     TEST>
```

F2/SPEED Press the F2 key to select CONDITION LIST.

```
     CONDITION LIST>
          SELF TEST>
          DATA DUMP>
```

The following message appears.
Confirm the pen is mounted on the carriage.

```
MOUNT THE PEN!

                DONE>
  CANCEL CONDITIONS>
```

F3/QUALITY Press the F3 key to select DONE and start plotting.

F4/OFFSET Press the F4 key to select CANCEL CONDITIONS.

You have to turn off the plotter to cancel CONDITION, if the plotter is in CONDITION mode.

The following message appears and the plotter begins printing a list of the currently set cutting conditions.

```
  PRINT CONDITIONS
```

When all of the data has been printed, turn off the plotter to cancel CONDITION mode.

Sample printout of the CONDITION function

COND	FORCE	SPEED	PEN TYPE	OFST	ACCL	TNGNT	OVCUT
✻1	12	30	PEN	0	4	OFF	
2	14	30	CB09Ux	0	4	OFF	
3	17	30	OTHER	+17	4	ON	0.2 0.2
4	25	10	CB15Ux	0	1	OFF	

RS-232C	BAUD RATE	PARITY	DATA BIT	HANDSHAKE
✻1	9600	N	8	H
2	9600	E	7	H
3	9600	E	8	H

COMMAND	GP-GL	STEP SIZE	0.100
HP-GL ORIGIN	L.L.	PAGE LENGTH	2000
PEN UP SPEED	AUTO	STEP PASS	0
OFFSET FORCE	4	OFFSET ANGLE	30
ROTATE	OFF	MIRROR	OFF
DISTANCE ADJ	0 0		
DISPLAY UNIT	Mm	COPY SPACE	1
AXIS TOOL	LIGHT POINT	AXIS METHOD	2POINT
AUTO PRE FEED	DISABLED	PRE FEED LENG	1
TANGENTIAL MODE	MODE 1	FEED SPEED	NORMAL
EXPAND LENG	O	SORT	DISABLED
; , : COMMAND	ENABLED	MODEL EMULATED	7550
W COMMAND	PEN DOWN	PEN UP MOVE	ENABLED
COND. PRIORITY	MANUAL	MEDIA SIZE SENSOR	OFF
INIT. BLADE CTRL	2mm BELOW	PIONCH ROLLER SENSOR	OFF
DISPLAY LANG	Japanese	HL CIR RESOL	DEFAULT
ROM VERSION	1.00		

DATA DUMP - Using the Character Dump Mode

This mode enables experienced users to detect the exact cause of communication problems between the plotter and the computer. In character dump mode, an exact print out of the codes reaching the plotter is produced.

NOTE: When the plotter receives READ commands that instruct it to output data, it will output dummy data (except in the case of READ commands that request the output of the plotter's status data). Note that printing in dump mode will be based on that dummy data.

If the cutting/plotting results are not what you expected, but the received data and the transmitted program are identical, check the program at the computer again.

If the cutting/plotting results are not what you expected, and the received data and the transmitted program are different, check the interface conditions and the connection of the interface cable.

WARNING: The pen starts moving as soon as the data is transmitted to the plotter from the computer. To avoid injury to yourself and damage to the plotter, keep your hands, face and other obstacles out of the vicinity of the cutting mat and paper.

CAUTION: Mounting the cutter pen for this mode may cause fatal damage to the cutting mat. Be sure to mount the plotter pen.

Load paper whose size is larger than either ISO (A4) or Letter size (11" x 8½") and mount the plotter pen.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F4 key to select OPTION 2.

```
                OPTION 1>
                OPTION 2>
```

Press the F4 key to select TEST.

```
    DISTANCE ADJUST>
                TEST>
```

F4/OFFSET Press the F4 key to select DATA DUMP.

```
    CONDITION LIST>
         SELF TEST>
         DATA DUMP>
```

The following message appears.
Confirm pen is mounted on the carriage.

```
MOUNT THE PEN!

              DONE>
 CANCEL CONDITIONS>
```

F3/QUALITY Press the F3 key to select DONE and start plotting.

F4/OFFSET Press the F4 key to select CANCEL CONDITIONS.

You have to turn off the plotter to cancel DUMP, if the plotter is in DUMP mode.

The following prompt message appears.

```
PRINT DATA DUMP
```

Transmit the data from the computer. As the data is received, the character data is printed as ASCII codes and the non-character (control) data is plotted as two-digit hexadecimal values (e.g., Line Feed = 0A, Carriage Return = 0D, ETX = 03).

When all of the data has been printed, turn off the plotter to cancel DUMP mode.

SELF TEST - Running the Self Test

Your plotter is provided with a self test function that enables it to check its own functions. Because a correctly drawn self test pattern signifies that all of the functions of the plotter (excluding the interface settings) have been tested and found normal, this function is useful for determining whether the source of a problem is the plotter itself or in the connection between the plotter and the computer.

WARNING: The pen starts moving as soon as SELF TEST mode is executed. To avoid injury to yourself and damage to the plotter, keep your hands, face and other obstacles out of the vicinity of the cutting mat and paper.

Load paper whose size is larger than either ISO (A4) or Letter size (11" x 8½") and mount the plotter pen.

CAUTION: Mounting the cutter pen for this mode may cause fatal damage to the cutting mat. Be sure to mount the plotter pen.

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

Press the NEXT key again.

Press the F4 key to select OPTION 2.

```
                    OPTION 1>
                    OPTION 2>
```

Press the F4 key to select TEST.

```
                 DISTANCE ADJUST>
                            TEST>
```

Press the F3 key to select SELF TEST.

```
                CONDITION LIST>
                     SELF TEST>
                     DATA DUMP>
```

The following message appears.
Confirm the pen is mounted on the carriage .

```
MOUNT THE PEN!

                          DONE>
  CANCEL CONDITIONS>
```

Press the F3 key to start plotting.

Press the F4 key to cancel plotting.

You may have to turn off the plotter to cancel SELF TEST if the plotter is in the SELF TEST mode.

The following message appears.

```
SELF TEST
```

When you have finished printing the SELF TEST pattern, turn off the plotter to cancel SELF TEST mode.

NOTE: The self test pattern is repeatedly printed until the plotter is turned off. To discontinue printing, even if a pattern is not completely printed, simply turn off the plotter.

Troubleshooting - The Plotter is Turned on but it Doesn't Work

Symptom	Cause	Solution
The control panel's POWER lamp does not light.	The plotter is not being supplied with power.	Check that the power cord is securely connected to the plotter's AC line inlet and the electrical output.
	The circuit protection on the machine is activated by overloading and it had not yet been deactivated.	Turn off the power switch and unplug the power cord. After 5 or 10 minutes, connect the power and turn on the system. If it does not reactivated, turn off the power switch and unplug the power cord and wait, the recovery time can vary from case to case. If the machine does not recover after 30 minutes, contact your sales representative or nearest Graphtec dealer.
	The plotter is defective.	Contact your sales representative or nearest Graphtec dealer.
The control panel's POWER lamp lights but the plotter does not operate.	The ROM or RAM is defective.	Contact your sales representative or nearest Graphtec dealer.
The control panel's MENU lamp flickers and nothing appears on the display panel.	The ROM or RAM is defective.	Contact your sales representative or nearest Graphtec dealer.
The control panel's POWER lamp lights but the plotter does not operate. The message below appears:	The ROM or RAM is defective	Contact your sales representative or nearest Graphtec dealer.
Sum-Ck ROM RAM ERR!!		

Troubleshooting – Improper Initialization

Problem	Cause	Solution	See section
Media falls down during initialization.	The media sensors may be defective.	Contact your sales representative or nearest Graphtec dealer. You can start your job by temporarily disabling the media size sensing function.	Media size sensor setting in the background settings.
Media skews as soon as media starts to move.	One of the pinch rollers is not set on the grit roller.	Check the position of the pinch rollers.	Loading Media
After pen carriage moved across the plotter, media does not move.	Both of the pinch rollers may not be set on the grit rollers.	Check the position of the pinch rollers.	Loading Media
One side of media edge comes off from the pinch roller.	The front or rear edge of the media is not cut straight.	Cut the media edge straight.	
After selecting media type, pen carriage moves slowly and hits the side wall on the right hand side, then position error occurs.	Pinch roller sensor may be defective.	Contact your sales representative or nearest Graphtec dealer. You can start your job by temporarily disabling the pinch roller sensing function.	Pinch roller sensor setting in the Back ground settings.
Even when the media set lever is raised and locked, the menu keeps on showing LOAD MEDIA! Message.	Media set lever sensor may be defective.	Contact your sales representative or nearest Graphtec dealer.	

Troubleshooting – Plotter does not Operate Properly

Problem	Cause	Solution	See section
As soon as the data is sent to plotter, pen carriage or media moves then stops. Display shows WORKING. Processing Indicator LED lights.	Position of the plot data is located beyond the effective cutting area.	Adjust the position of the data on application software.	
As soon as the data is sent to plotter, pen carriage or media do not move at all. Display shows WORKING. Processing Indicator LED lights.	Origin point might be set at lower left although the plot data is created based on center origin.	Check the origin setting.	Origin
Origin point seems to be shifted to center, although origin button is not pressed.	Origin point might be set at center although the plot data is created based on lower left origin.	Check the origin setting.	Origin
As soon as the data is sent to the plotter, the media comes off, then MEDIA END message appears.	ROLL-1 or ROLL-2 is selected for sheet media and the origin is set as center.	Select SHEET for sheet media.	Loading Media
COMMAND ERROR message appears.	Data from PC is not received correctly.		
INSTRUCTION NOT RECOGNIZED message appears.	Data from PC is not received correctly.		
Plotter does not cut beyond certain length.	PAGE LENGTH is not set correctly.	Check the cut area by pressing the ENTER key. Set PAGE LENGTH correctly.	Page Length
Too much pen up/down action is performed.	TANGENTIAL EMULATION is enabled.	Normal. If TANGENTIAL is displayed on the READY menu, change the condition number on which the TANGENTIAL EMULATION is not enabled or disable the EMULATION.	Tangential Emulation
Plotter cuts on foot print of grit rollers.	EXPAND setting.	Set EXPAND zero if necessary.	Expand

Problem	Cause	Solution	See section
Cutting CONDITION setting can not be changed.	DATA SORTING is enabled.	Normal. Disable DATA SORTING if necessary.	Data Sorting
The currently selected cutting conditions are disregarded or cannot be changed.	The parameter priority setting is set to program mode.	Change the parameter priority setting to manual mode.	Setting Cutting Conditions
	The ENTER key was not pressed after changing settings.	Verify setting the conditions correctly.	Setting Cutting Conditions
Media is fed at an angle.	Media has been loaded at an angle. The total amount of roll media to be cut was not pulled out in advance.	Reload media correctly. Pull out the required amount of media in advance.	Loading Media Loading Media
Media is abruptly fed forward.	Incorrectly selected media type.	Correctly set the media type to match your media.	Selecting Media
The length of cutting results differs from the program (slight distance error).	The media is slipping.	Lower the cutting SPEED or the PEN UP SPEED setting.	Setting Cutting Conditions or Pen Up Speed
	The distance correction requires adjustment.	Adjust the distance correction.	Distance Adjust
When the plotter is receiving data, the Process Indicator lamp lights (an off scale error occurs).	The programmable resolution (STEP SIZE) has been set differently at the plotter and the software application.	Set both the plotter and software to the same resolution.	Step Size
	The computer sent coordinate data that exceeds the specified effective cutting area.	Set the effective cutting area to a larger area.	Area
	The computer sent coordinate data that exceeds the maximum effective cutting area.	Switch to a larger media or change the coordinate data.	Area

Problem	Cause	Solution	See section
Media is loaded but the LOAD PAPER !! message appears.	Media that is nearly transparent cannot be detected by the paper sensors.	Disable the paper sensors using media size sensor control in the background settings.	Media size sensor setting in the Background settings.
	Strong reflected light is preventing the paper sensors from detecting the media.	Change the position of the light source.	
	Loaded media has not been positioned over the paper sensors.	Properly reload the media.	Loading Media

Troubleshooting – Poor Cutting Results

Problem	Cause	Solution	See section
The cut corners are too rounded.	The CUTTER OFFSET is incompatible with the blade type being used.	Adjust the CUTTER OFFSET value. If too low, corners become rounded.	Setting Cutting Conditions
The cut corners are too pointed.	The CUTTER OFFSET is incompatible with the blade type being used.	Adjust the CUTTER OFFSET value. If too high, corners become pointed.	Setting Cutting Conditions
The Cut Line starts out crooked.	The blade mounted in the folder does not rotate smoothly.	Grease the blade and holder.	Replacing Cutter Blade
		Remove any foreign matter inside the pen holder.	
	The Offset Cut Pressure is too low.	Raise the Offset Cut Pressure setting (the Offset Cut Pressure is separate from the cutting force).	Offset Force
	With the 0.9 mm cutter pen (blue blade adjustment knob), the spring has come loose from the blade.	Replace the blade with a new one that has a spring.	Replacing Cutter Blade
	With the 1.5 mm cutter pen (red blade adjustment knob), the blade has fallen out	Grease blade and holder.	Replacing Cutter Blade
The blade skips and does not completely cut lines that should be solid.	The blade is extended too far.	Adjust the blade length.	Blade Length
	The cutting SPEED is too high.	Lower the SPEED Setting.	Setting Cutter Conditions
Solid lines are not cut at a constant depth.	The blade is extended too far.	Adjust the blade length..	Blade Length
	The cutting SPEED is too high.	Lower the SPEED Setting.	Setting Cutter Conditions

Problem	Cause	Solution	See section
Coarse resolution of curved lines.	The software's resolution setting is too low.	Adjust the software's resolution setting.	
	The blade offset angle is too low.	Raise the blade offset angle.	Setting Cutter Conditions
The media curls up at the corners.	The blade is extended too far.	Adjust the blade length.	Blade Length
	The CUTTER OFFSET is incompatible with the blade type being used.	Adjust the CUTTER OFFSET value. If too low, corners become rounded.	Setting Cutter Conditions
		Adjust the CUTTER OFFSET value. If too high, corners become pointed.	Setting Cutter Conditions
	The cut pattern is too fine.	Use the tangential emulation mode.	Tangential Emulation
	The cutting SPEED is too high.	Lower the SPEED Setting.	Setting Cutter Conditions
	The blade is dull.	Replace the blade.	Replacing Cutter Blade
	The QUALITY setting is too high.	Lower the QUALITY setting.	Setting Cutter Conditions
The blade is cutting into the backing sheet.	The blade is extended too far.	Adjust the blade length.	Blade Length
	The cutting FORCE is too high.	Lower the FORCE setting.	Setting Cutter Conditions
The blade falls out of the plunger.	The blade is too small for the holder.	Use a blade that fits securely in the holder.	Replacing Cutter Blade
	Insufficient grease.	Grease the cutter blade and holder.	Replacing Cutter Blade
Media can be cut but it is hard to weed afterward.	The retack sheet is not sticky enough.	Switch to a retack sheet that is more sticky.	
	Media gets entangled during cutting.	Reduce the blade length.	Blade Length
		Lower the cutting FORCE.	Setting Cutter Conditions
	Cleaning of cut media was postponed too long.	Promptly weed cut media.	

Problem	Cause	Solution	See section
Cut media cannot be picked up using a retack sheet.	The retack sheet is not sticky enough.	Switch to a retack sheet that is more sticky.	
	Media gets entangled during cutting.	Reduce the blade length.	Blade Length
		Lower the cutting FORCE.	Setting Cutter Conditions
	Cleaning of cut media was postponed too long.	Promptly weed cut media.	
Abnormal noise generated by cutter pen during cutting.	Media is stuck in the tip of the cutter plunger.	Adjust the blade length and cutting FORCE setting.	Setting Cutter Conditions
The media is discolored where the blade has passed.	Media is stuck in the tip of the cutter plunger.	Adjust the blade length and cutting FORCE setting.	Setting Cutter Conditions
The cutting results differ from specified size	The programmable resolution (STEP SIZE) has been set differently at the plotter and the software application.	Set both the plotter and software to the same resolution.	Step Size
	Scaling has been specified at the software application.	Check whether scaling has been specified.	Scale
Some parts of the media cannot be cut.	The programmable resolution (STEP SIZE) has been set differently at the plotter and the software application.	Set both the plotter and software to the same resolution.	Step Size
	The computer sent coordinate data that exceeds the specified effective cutting area.	Set the effective cutting area to a larger area.	Area
	The computer sent coordinate data that exceeds the maximum effective cutting area.	Switch to a larger media or change the coordinate data.	Loading Media
Characters or lines are deformed during pen plotting.	The plotter is in cutting mode.	Set the blade type on the CUTTER OFFSET function to PEN (0).	Setting Cutter Conditions

Problem	Cause	Solution	See section
Cut characters are deformed.	The Step pass is too high.	Lower the step pass setting.	Step Pass
The starting and end points of cutting do not match.	Coordinate points are incorrectly specified.	Check the coordinate data by plotting it with a pen.	
	The Offset Cut Pressure is too low.	Raise the Offset Cut pressure setting.	Setting the Cutting Conditions
	The media is too flimsy.	Switch to a stronger media.	
	Blade rotation is not smooth.	Grease the cutter blade and holder.	Replacing the Cutting Blade
The starting and end points of cutting thick material do not match.	Over cutting is too short.	Set over cut distance correctly.	Tangential Emulation
The starting and end points of cutting do not match when auto pre feed function is used.	Pen speed is too high, or the Quality setting is incorrect.	Set pen condition correctly.	Setting the Pen Condition

Error Messages and Their Causes

Error Messages with their Possible Causes and Probable Solution.

```
OVER CURRENT

POWER OFF THEN ON
```

· **The beeper sounds**

Cause	Solution
Excessive load is causing the current to the motor to exceed the rated value	
• Cutting conditions do not suit the cutting media	⇒ Lower the cutting SPEED and/or the cutting FORCE
• Movement of the pen carriage is being obstructed	⇒ Turn off the plotter, remove the obstacle, then turn the plotter back on.
• The pen carriage was subjected to external pressure during cutting	⇒ Turn off the plotter, remove the obstacle, then turn the plotter back on.
• Media scraps stuck in moving parts and impeding plotter operation	⇒ Turn off the plotter, remove the media scraps, then turn the plotter back on
• Abnormal acceleration rate table	* If error occurs frequently, contact your sales representative or nearest Graphtec dealer.

```
SPEED ALARM

POWER OFF THEN ON
```

· **The beeper sounds**

Cause	Solution
• Immediately after turning on the plotter, excessive force was used to manually move the pen carriage	⇒ Turn the plotter off then back on again
• Internal speed control is faulty	⇒ Turn the plotter off then back on again * If error occurs frequently, contact your sales representative or nearest Graphtec dealer.

```
POSITION ALARM

POWER OFF THEN ON
```

· **The beeper sounds**

Cause	Solution
Excessive load is causing the current to the motor to exceed the rated value	
• Cutting conditions do not suit the cutting media	⇒ Lower the cutting SPEED and/or the cutting FORCE
• Movement of the pen carriage is being obstructed	⇒ Turn off the plotter, remove the obstacle, then turn the plotter back on.
• The pen carriage was subjected to external pressure during cutting	⇒ Turn off the plotter, remove the obstacle, then turn the plotter back on.
• Media scraps stuck in moving parts and impeding plotter operation	⇒ Turn off the plotter, remove the media scraps, then turn the plotter back on
• Abnormal acceleration rate table	* If error occurs frequently, contact your sales representative or nearest Graphtec dealer.

Command Error Messages and Their Causes

Error Messages in GP-GL Command Mode

```
ERROR 1

COMMAND ERROR
```

Cause	Solution
The plotter received an unrecognizable command.	
• Noise was input to the plotter upon execution of the software application	⇒ Press the ENTER key
• The software configuration regarding the output device has been changed	⇒ Configure the software to drive your plotter. Ensure that the software's interface conditions are correctly set.
• The plotter's interface conditions have been changed.	⇒ Ensure that the plotter's interface conditions are set to match those of the software.

```
ERROR 4

PARAMETER OVERFLOW
```

Cause	Solution
A command was received containing numeric parameter that exceeds that command's permissible range.	
• The software configuration regarding the output device has been changed	⇒ Configure the software to drive your plotter. Ensure that the software's interface conditions are correctly set.
• The plotter's interface conditions have been changed	⇒ Ensure that the plotter's interface conditions are set to match those of the software.

ERROR 5 I/O ERROR		
Cause		**Solution**
An error occurred during data transfer		
• The software configuration regarding the output device has been changed	⇒	Configure the software to drive your plotter. Ensure that the software's interface conditions are correctly set.
• The plotter's interface conditions have been changed	⇒	Ensure that the plotter's interface conditions are set to match those of the software.

Error Messages in HP-GL Command Mode

If any of the following command errors occur, they are nearly always caused by one of the reasons below:

1. The software configuration regarding the output device has been changed; or
2. The plotter's interface conditions have been changed.

When a command error occurs in HP-GP™ emulation mode, first check that you have:

1. Configured the software to drive your plot
2. The software's interface conditions are set correctly.
3. Set the plotter's interface conditions to match the software's interface conditions.

	Cause	Solution
ERROR 1 Instruction Not recognized	An unrecognizable instruction was executed.	Execute a recognizable command.

	Cause	Solution
ERROR 2 Wrong number of parameters	A command was executed with the wrong number of parameters.	Executed the command with the correct number of parameters.

	Cause	Solution
ERROR 3 Out of range parameters	A command containing an unusable parameter was specified.	Execute the command with its parameters specified within their permissible ranges.

	Cause	Solution
ERROR 5 Unknown character set	An unrecognizable instruction was executed.	Specify a recognizable command.

	Cause	Solution
ERROR 6 Position overflow	A command was executed with coordinate data that exceeds the effective cutting/plotting area.	Execute the command with its coordinate data specified within the effective cutting/ plotting area.

	Cause	Solution
ERROR 7 Buffer overflow	The data being input exceeds the capacity of the plotter's downloadable character buffer, polygon buffer, etc.	Increase buffer size

ERROR 10 Invalid I/O output request	Cause	Solution
	During the execution of an output command, another output command was executed.	Check the flow of your programmed data.

ERROR 11 invalid byte following ESC.	Cause	Solution
	The ESC character was followed by an invalid byte.	Check the ESC command in your program

ERROR 12 invalid byte in I/O control	Cause	Solution
	A device control command containing an invalid byte was received.	Check the device control commands in your program.

ERROR 13 Out of range I/O parameters	Cause	Solution
	A parameter outside of the permissible numeric range was specified.	Check the program

ERROR 14 Too many I/O parameters	Cause	Solution
	Too many parameters were received	Check the number of command parameters

ERROR 15 Error in I/O transmission	Cause	Solution
	During data transfer, a framing error, parity error or overrun error occurred.	Check the settings of the interface conditions

ERROR 16 I/O buffer overflow	Cause	Solution
	The I/O buffer received data at a faster pace than it could process, indicating that handshaking is not successful	Check the settings of the handshaking mode and other interface conditions.

Chapter 7 Setting The Interface Functions

This chapter describes how to connect your plotter to your computer.

Setting the Parallel Interface

- To use the Centronics-compatible parallel interface, connect the plotter's parallel connector to the computer's parallel port by cable.
- Next, simply set the command mode plus the programmable resolution (when GP-GL command is selected), or origin (when HP-GL command is selected),

For instructions on setting the functions, see ***Selecting the Command Mode*** and ***Setting the Programmable Resolution***.

CAUTION: The interface cable should be no longer than two meters.

NOTE: For the specifications of your plotter's parallel interface, see ***Centronics-Compatible Parallel Interface.***

Setting the Serial Interface

- To enable prompt compatibility with multiple software applications, you can register three different groups of interface settings (RS-1, RS-2, and RS-3) in the plotter's memory.
- The desired group of RS-232C interface settings can be loaded from the control panel.
- Incorrectly set interface conditions can cause the plotter to malfunction.
- Be sure to set the plotter's interface conditions to match those of your computer and the target software application.

NOTE: For the specifications of your plotter's serial interface, see ***RS-232C Serial Interface***.

Factory Preset Interface Settings

Your plotter comes with its three groups of interface conditions set to the factory presets listed in the table below.

RS-1	9600 BAUD
	8 BIT
	NONE PARITY
	HARDWIRE

RS-2	9600 BAUD
	7 BIT
	EVEN PARITY
	HARDWIRE

RS-3	9600 BAUD
	8 BIT
	EVEN PARITY
	HARDWIRE

INTERFACE - Setting the Interface Functions

The Interface Functions (Step Size, RS-232C and COMMAND Settings) can be set before or after loading media.

How to get to the INTERFACE menu before you have loaded media

When the media set lever is lowered, the following menu appears.

```
     LOAD MEDIA!


       INITIAL MENU>
```

F4/OFFSET Press the F4 key to select INITIAL MENU.

```
      AUTO PRE FEED>
INITIAL FEED SPEED>
          INTERFACE>
```

F3/QUALITY Press F3 key to select RS-232C and the INTERFACE menu appears.

```
           STEP SIZE>
             RS-232C>
             COMMAND>
```

Press the NEXT key twice to go back to the LOAD MEDIA menu.

How to get to the INTERFACE menu after you have loaded media

After the media is loaded and initialization is performed, the plotter goes to READY mode.

```
CONDITION 2      14
                 3Ø
  READY           4
            CBØ9Ux Ø
```

Press the MENU key to select MENU mode.

Press the NEXT key.

Press the NEXT key again.

F1/FORCE Press F1 key to select INTERFACE.

```
          INTERFACE>
AREA PARAMETERS>
       FUNCTION 1>
       FUNCTION 2>
```

F3/QUALITY Press F3 key to select RS-232C and the INTERFACE menu appears.

```
           STEP SIZE>
             RS-232C>
             COMMAND>
```

Press the MENU key to return to READY mode.

STEP SIZE - Setting the Programmable Resolution

When HP-GL™ command mode is selected, this STEP SIZE is not displayed. When the GP-GL command mode is selected, this function allows you to set the distance of pen movement corresponding to the coordinate value of 1.

NOTE: Be sure to set the step size to match the step size setting of your software application

NOTE: Your step size setting is retained in the plotter's internal memory even while the plotter is turned off.

F2/SPEED — Press F2 key to select STEP SIZE.

```
          STEP SIZE>
            RS-232C>
            COMMAND>
```

F1/FORCE — Press F1 key to select 0.100.

F2/SPEED — Press F2 key to select 0.050.

F3/QUALITY — Press F3 key to select 0.025.

F4/OFFSET — Press F4 key to select 0.010.

```
STEP SIZE     0.100*
  IN mm       0.050
              0.025
              0.010
```

↵ — Press the Enter key to register your setting and return to the INTERFACE menu.

```
          STEP SIZE>
            RS-232C>
            COMMAND>
```

RS-232C – Setting the Data Transmitting Conditions

This function selects and sets the data transmitting condition of the serial interface. Three preset conditions are available for easy access.

NOTE: Be sure to set the transmitting conditions to match the setting of your software applications

NOTE: Your RS-232C setting is retained in the plotter's internal memory while the plotter is turned off.

F3/QUALITY — Press F3 key to select RS-232C.

```
          STEP SIZE>
            RS-232C>
            COMMAND>
```

F1/FORCE — Press the F1 key to select factory setting 1.

F2/SPEED — Press the F2 key to select factory setting 2.

F3/QUALITY — Press the F3 key to select factory setting 3.

```
   RS-232C      *1>
CONDITION NO.    2>
                 3>
```

The asterisk is displayed beside the currently selected condition number.

The menu that corresponds to the number you selected will appear

```
RS-1     9600 BAUD
            8 BIT
       NONE PARITY
         HARDWIRE
```

```
RS-2     9600 BAUD
            7 BIT
       EVEN PARITY
         HARDWIRE
```

```
RS-3     9600 BAUD
            8 BIT
       EVEN PARITY
         HARDWIRE
```

You can modify any of the RS232-C settings by pressing the F1, F2, F3 or F4 key. The blinking cursor will move to the parameter that corresponds with that key.

```
RS-1     9600 BAUD
            8 BIT
       NONE PARITY
         HARDWIRE
```

F1/FORCE — Press the F1 key to change BAUD RATE.

F2/SPEED — Press the F2 key to change DATA LENGTH.

F3/QUALITY — Press the F3 key to change PARITY BIT.

F4/OFFSET — Press the F4 key to change HANDSHAKING.

Press the UP or DOWN ARROW key to change the parameter's setting.

Press the ENTER key to register your settings and return to the INTERFACE menu.

COMMAND - Selecting the Command Mode

This function selects the command mode, either HP-GL™ or GP-GL.

NOTE: Be sure to set the command mode to match the command mode setting of your software application

NOTE: Your command setting is retained in the plotter's internal memory even while the plotter is turned off.

F4/OFFSET Press the F4 key to select COMMAND.

```
STEP SIZE>
  RS-232C>
  COMMAND>
```

F3/QUALITY Press the F3 key to select GP-GL command mode.

F4/OFFSET Press the F4 key to select HP-GL command mode.

```
COMMAND

          GP-GL*
          HP-GL
```

↵ Press the Enter key to register your setting.

If you started at the LOAD MEDIA menu you will return to the INTERFACE MENU.
If you started at the READY menu you will return to the MEDIA TYPE menu.

Centronics-Compatible Parallel Interface

This eight-bit Centronics-compatible parallel interface is generally used for interfacing printers. The input signals are grouped into the eight bits of the DATA signals (DB0 to DB7), and each group of eight DATA signals is followed by the input of an active-LOW STROBE signal. Upon receipt of the STROBE signal, the plotter activates its BUSY signal, outputs an ACK signal, then reads the input DATA Signals to begin a cutting or plotting operation.
When the specified operation is completed, the plotter awaits the input of subsequent DATA signals.

CAUTION: The interface cable should be no longer than two meters.

Specifications

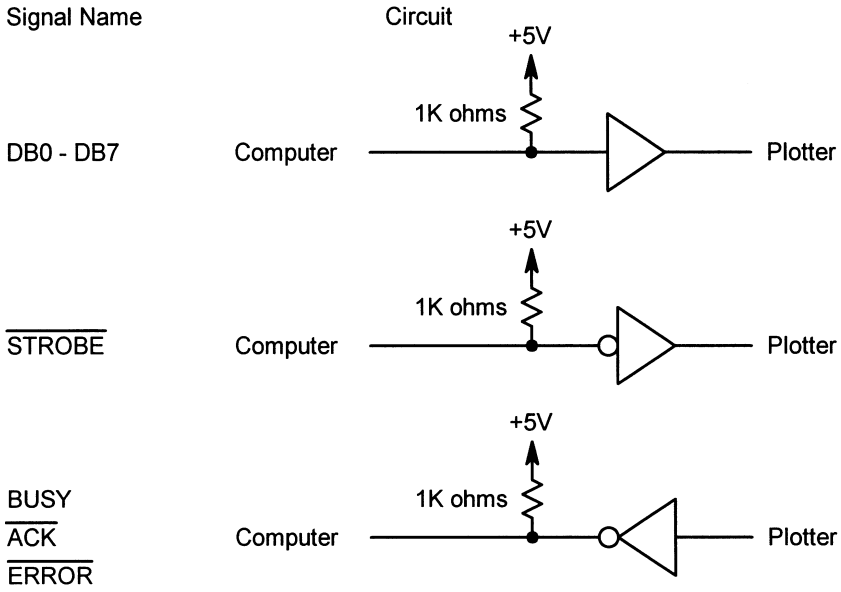
- While the parallel interface is used, data cannot be output from the plotter (that is, READ commands cannot be used with the exception of the “BS” command).
- Synchronization method: Asynchronous transmission by handshaking is based on STROBE and BUSY signals.

Electrical Characteristics

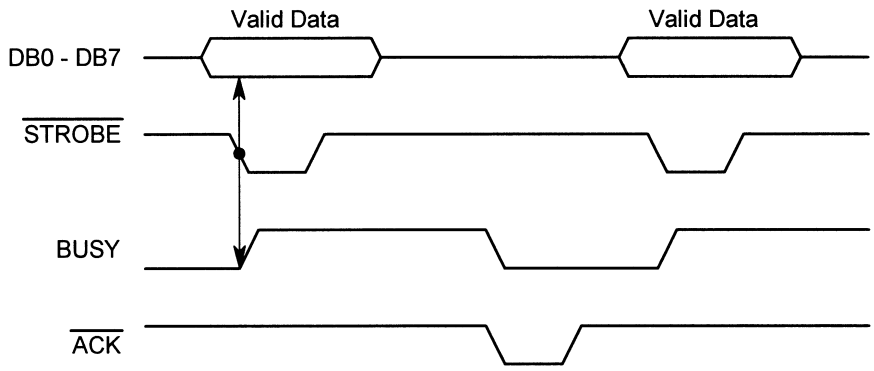
Based on TTL-level compatibility with the logic states below.

Positive logic	“1” + 2.2V or more “0” + 0.8V or less	DATA, BUSY
Negative logic	“1” + 0.8V or more	$\overline{\text{ERROR}}$
	“0” + 2.2V or less	$\overline{\text{ACK}}$, $\overline{\text{STROBE}}$

Input/Output Circuitry



Input/Output Timing Chart



Pin Assignment of the Parallel Connector

The pin assignment of the Centronics-compatible parallel interface connector is described below.

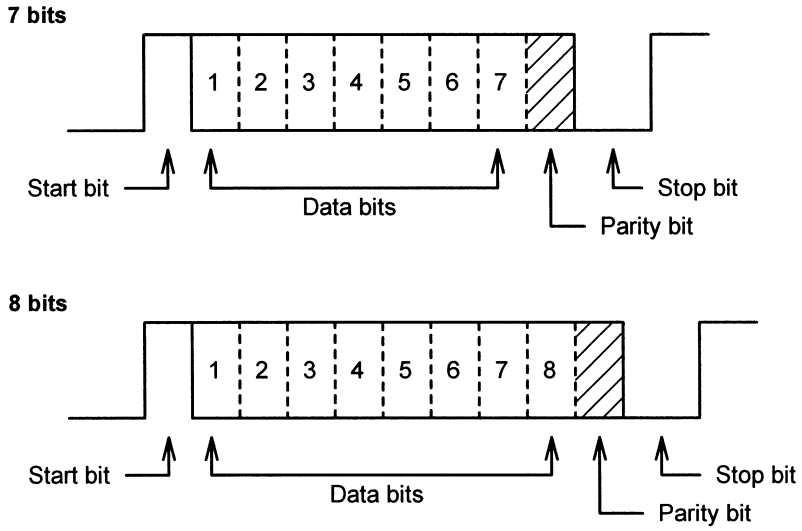
Pin No.	Signal Name	Pin No.	Signal Name
1	$\overline{\text{STROBE}}$	19	GND
2	DB 0	20	GND
3	DB 1	21	GND
4	DB 2	22	GND
5	DB 3	23	GND
6	DB 4	24	GND
7	DB 5	25	GND
8	DB 6	26	GND
9	DB 7	27	GND
10	$\overline{\text{ACK}}$	28	GND
11	BUSY	29	GND
12	GND	30	GND
13	SLCT	31	Not used
14	Not used	32	$\overline{\text{ERROR}}$
15	Not used	33	GND
16	GND	34	Not used
17	Not used	35	+ 5V pulled up.
18	+ 5V pulled up	36	Not used

RS-232C Serial Interface

The RS-232C Serial interface of your plotter conforms to the RS-232C Standard of Electronic Industries Association (EIA). This serial interface performs the serial transfer of digital binary data, control signals and SYNC signals.

Specifications

Standard	CCITT V.24, EIA RS-232C, JIS X5101
Synchronization	Asynchronous start-stop
Transfer Rate	19200 bits/s
Stop Bit	2 stop bits
Parity	Even, odd, none
Character length	7 or 8 bits



Electrical Characteristics

	RD,SD (Negative logic)	RS,CD,DR,ER (Positive Logic)
Input voltage level	+5V to +12V -5V to -12V	Logical “0” “ON” Logical “1” “OFF”
Output voltage level	+5V to +8V -5V to -8V	Logical “0” “ON” Logical “1” “OFF”

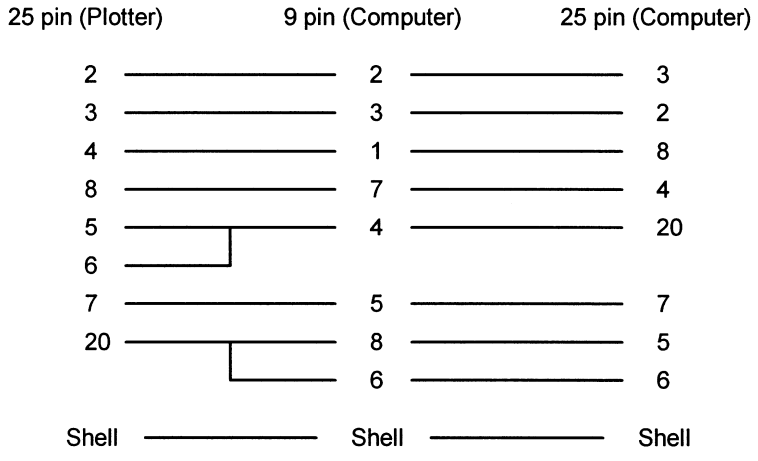
Pin Assignment of the Serial Connector

The pin assignment of the serial interface connector is described below.

Pin	Signal Name	Pin No.	Signal name
1	GND (Frame)	14	Not used
2	SD (TxD)	15	Not used
3	RD (RxD)	16	Not used
4	$\overline{\text{RS (RTS)}}$	17	Not used
5	$\overline{\text{CS(CTS)}}$	18	Not used
6	$\overline{\text{DR(DSR)}}$	19	Not used
7	GND (LOGIC)	20	$\overline{\text{ER (DTR)}}$
8	Not used	21	Not used
9	Not used	22	Not used
10	Not used	23	Not used
11	Not used	24	Not used
12	Not used	25	Not used
13	Not used		

Cable Connection

The cable pin assignment of the serial interface connector from the 25 pin plotter connector to the 9 pin computer connector or the 25 pin computer connector is described below.



Chapter 8 Specifications

This chapter describes the plotter's main specifications

Main Specifications: FC4100-75

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital Servo
Maximum cutting area	759 mm (29.9 in.)
Guaranteed precision cutting area	9 m (30 ft.) with approved media[1]
Compatible media width	851 mm (33.5 in.)
Maximum cutting speed	900 mm/sec with Firmware version 1.12 or before. 1260 mm/sec with Firmware version 1.13 or later.
Cutting pressure	350 g
Minimum character size	3 mm (0.125 in.) alphanumeric Helvetica med. Font
Mechanical resolution	0.005 mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01 mm (0.0004 in.) and HP-GL™[2] : 0.025 mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2 mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media[1], up to 0.25 mm thick, Sandblast rubber up to 1mm thick[3]
Standard interfaces	RS-232C, Centronics-compatible parallel
Buffer memory	1 Mb
Resident command sets	HP-GL™ [2], GP-GL
LCD Panel	20 characters x 4 lines: Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240 VAC/48-62 Hz Universal Power Supply
Power consumption	80 VA max.
Operating environment	Temperature: +10 º C to +35 º C (50 º F to 95 º F) Humidity 35 % to 75 % (non-condensing)
External dimensions	1054 mm (w) x 356 mm (h) x 465 mm (d) max. 41.5 in. (w) x 14 in. (h) x 18.3 in. (d) max.
Weight	Approximately 29 kg (64 lb.) [with Accuload installed]

1 When using Graphtec-specified media
2 HP-GL is a trademark of Hewlett-Packard Company
3 Using CB15U-K30 blades to cut sandblast rubber

Main Specifications: FC4100-100

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital Servo
Maximum cutting area	1067 mm (42 in.)
Guaranteed precision cutting area	9 m (30 ft.) with approved media[1]
Compatible media width	1173 mm (46.2 in.)
Maximum cutting speed	900 mm/sec with Firmware version 1.12 or before. 1260 mm/sec with Firmware version 1.13 or later.
Cutting pressure	350 g
Minimum character size	3 mm (0.125 in.) alphanumeric Helvetica med. Font
Mechanical resolution	0.005 mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01 mm (0.0004 in.) and HP-GL™ [2] : 0.025 mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2 mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media[1], up to 0.25 mm thick, Sandblast rubber up to 1mm thick[3]
Standard interfaces	RS-232C, Centronics-compatible parallel
Buffer memory	1 Mb
Resident command sets	HP-GL™ [2], GP-GL
LCD Panel	20 characters x 4 lines: Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240 VAC/48-62 Hz Universal Power Supply
Power consumption	90 VA max.
Operating environment	Temperature: +10 º C to +35 º C (50 º F to 95 º F) Humidity 35 % to 75 % (non-condensing)
External dimensions	1385 mm (w) x 1207 mm (h) x 623 mm (d) max. with stand 54.5 in. (w) x 47.5 in. (h) x 24.5 in. (d) max. with stand
Weight	Approximately 52 kg (115 lb.) [with the Stand and Accuload installed]

1 When using Graphtec-specified media
2 HP-GL is a trademark of Hewlett-Packard Company
3 Using CB15U-K30 blades to cut sandblast rubber

Main Specifications: FC4100-130

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital Servo
Maximum cutting area	1372 mm (54 in.)
Guaranteed precision cutting area	9 m (30 ft.) with approved media[1]
Compatible media width	1478 mm (58.2 in.)
Maximum cutting speed	900 mm/sec with Firmware version 1.12 or before. 1260 mm/sec with Firmware version 1.13 or later.
Cutting pressure	350 g
Minimum character size	3 mm (0.125 in.) alphanumeric Helvetica med. font
Mechanical resolution	0.005 mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01 mm (0.0004 in.) and HP-GL™ [2] : 0.025 mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2 mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media[1], up to 0.25 mm thick, Sandblast rubber up to 1mm thick[3]
Standard interfaces	RS-232C, Centronics-compatible parallel
Buffer memory	1 Mb
Resident command sets	HP-GL™ [2], GP-GL
LCD Panel	20 characters x 4 lines: Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240 VAC/48-62 Hz Universal Power Supply
Power consumption	100 VA max.
Operating environment	Temperature: +10 º C to +35 º C (50 º F to 95 º F) Humidity 35 % to 75 % (non-condensing)
External dimensions	1690 mm (w) x 1207 mm (h) x 623 mm (d) max. with stand 66.5 in. (w) x 47.5 in. (h) x 24.5 in. (d) max. with stand
Weight	Approximately 58 kg (128 lb.) [with Stand and Accuload installed]

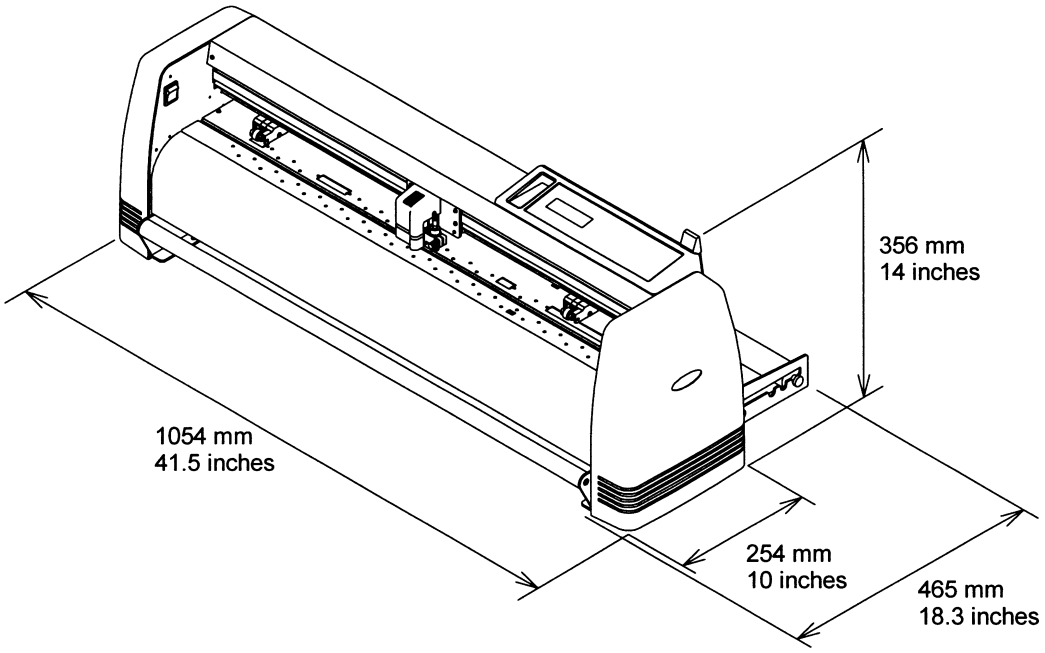
1 When using Graphtec-specified media
2 HP-GL is a trademark of Hewlett-Packard Company
3 Using CB15U-K30 blades to cut sandblast rubber

Options

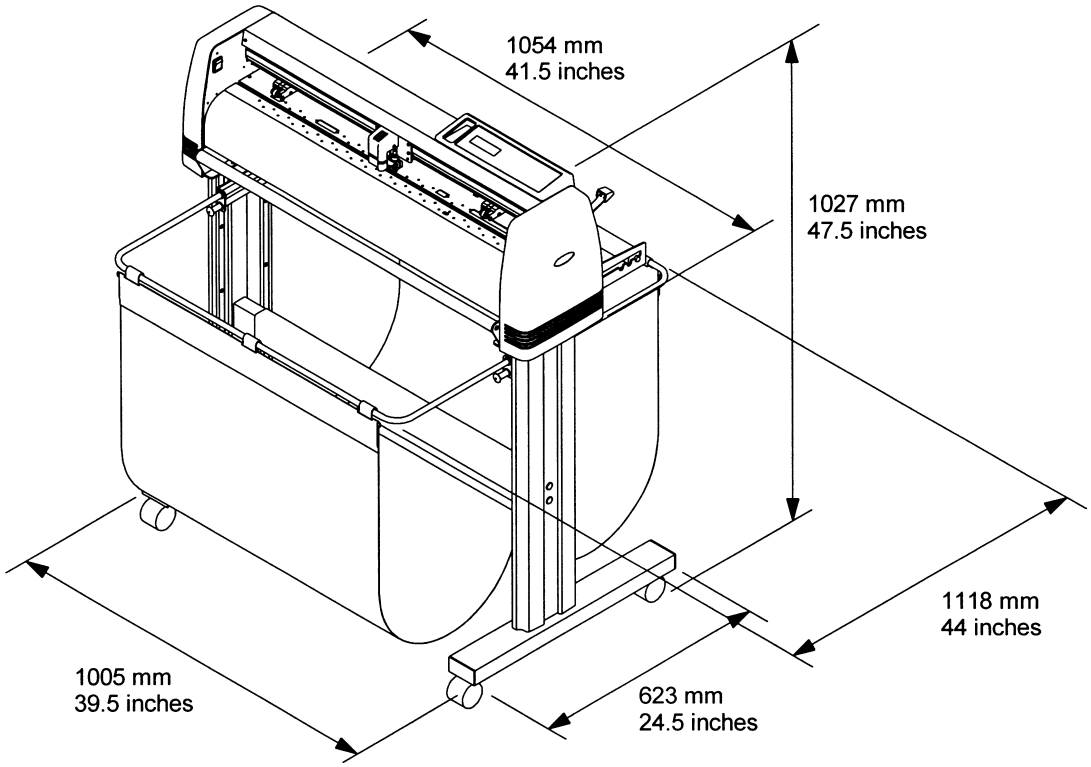
Item	Contents
Stand & Media Basket FC4100-75	Stand, Collapsible media basket
Media Basket FC4100-100	Collapsible media basket
Media Basket FC4100-130	Collapsible media basket
Multi Media Supply Kit FC4100-75	Rollers, Brackets
Multi Media Supply Kit FC4100-100	Rollers, Brackets
Multi Media Supply Kit FC4100-130	Rollers, Brackets
Pounce Tool	Pouncing tool assembly

External Dimensions

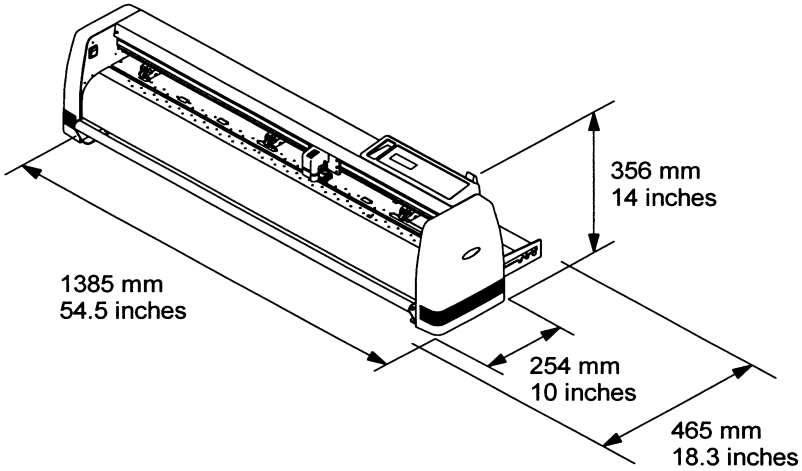
FC4100-75 without Stand



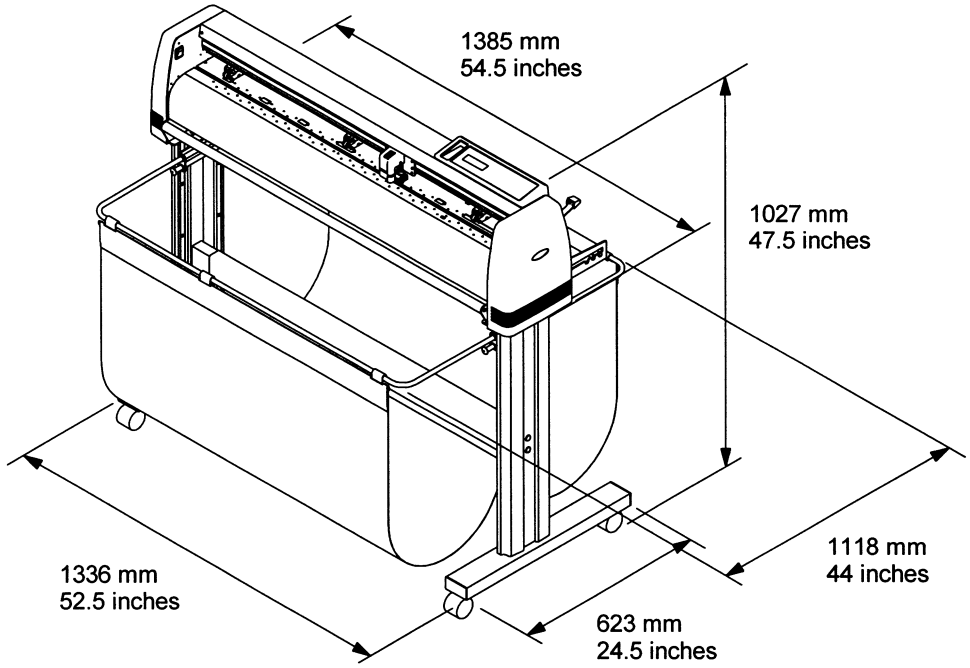
FC4100-75 with Stand and Basket Option



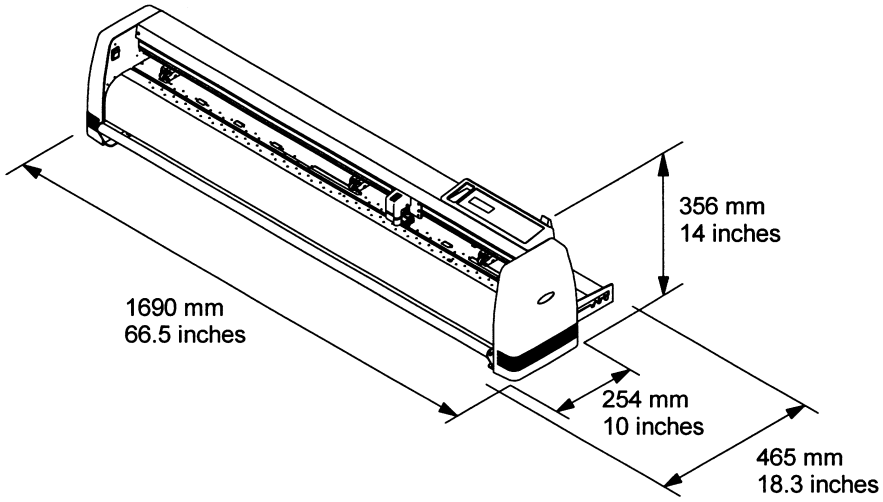
FC4100-100 without Stand



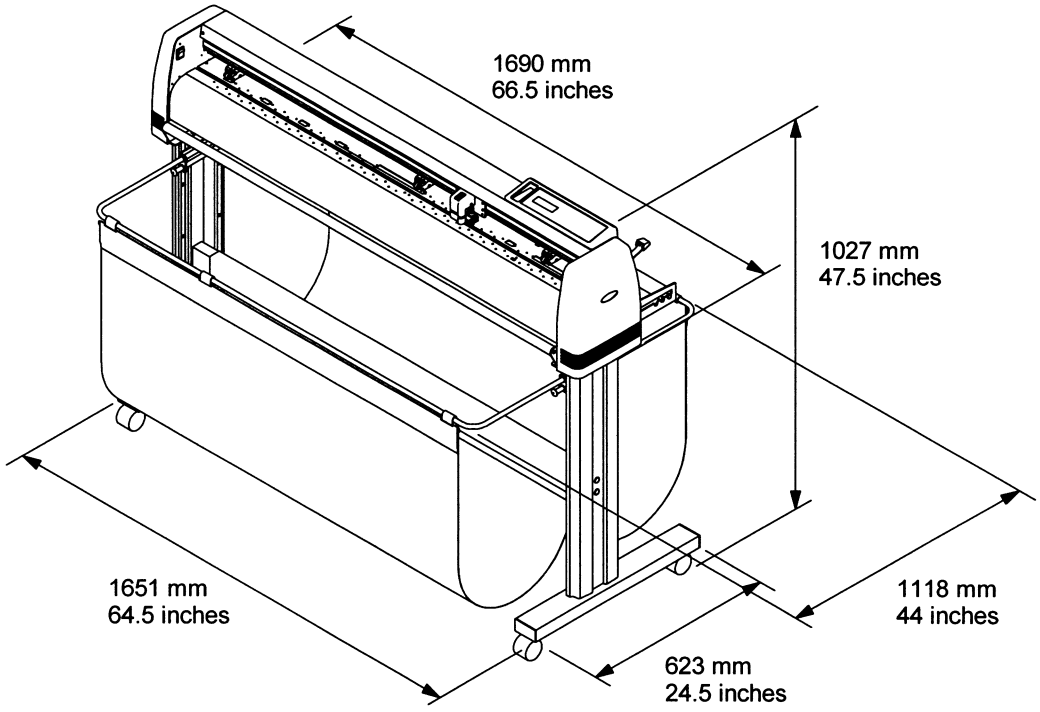
FC4100-100 with Stand (Standard) and Basket (Option)



FC4100-130 without Stand



FC4100-130 with Stand (Standard) and Basket (Option)



Chapter 9 Options

The following are the FC4100 option user manuals.

FC4100 Pounce Tool Manual

Pouncing is a method used to create a punched outline on media. This is done by inserting a special tool in the plotter that produces holes instead of plotting with a pen or cutting with a blade. This outline or pattern has many uses such as aligning letters on a large job or creating a chalk outline for graphics that will be hand-painted.

The pounce tool has a small point that is pressed into the media. The pounce conditions are set from the conditions menu.

Force: Sets the hole punching force during pouncing.

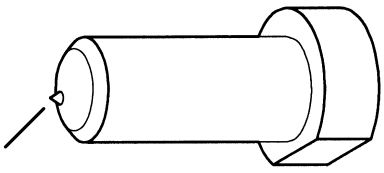
Speed: Sets the traveling speed of the lowered pouncing tool.

Quality: Sets the acceleration rate of the pouncing tool.

Offset: Sets the spacing between holes in mm units.

WARNING: To prevent bodily injury, handle the pouncing tool with care.

- Pounce tool points are very sharp. While handling the pounce tool be careful to avoid cutting your fingers or other parts of your body.



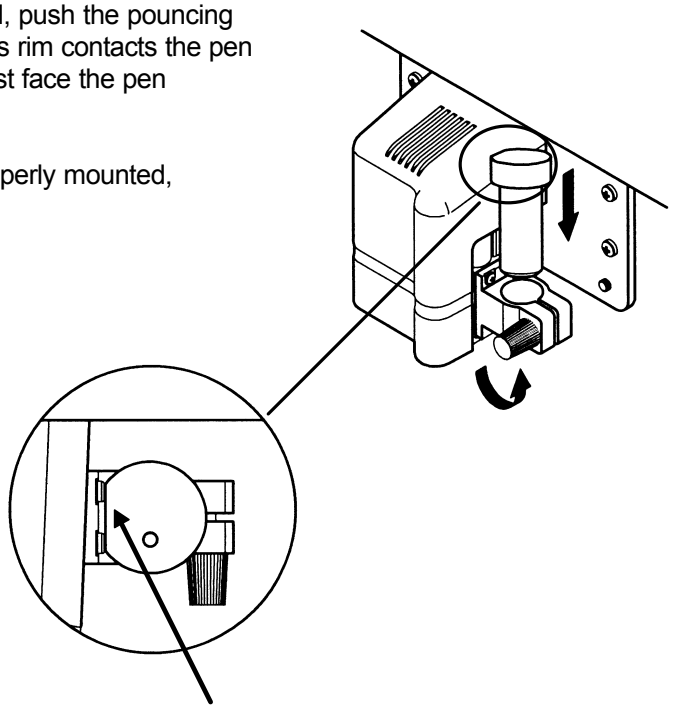
Inserting the Pounce Tool

Follow the procedure below to attach a pounce tool to the pen carriage:

1. Make sure the pen holder screw is loose.

2. While holding the pen holder upward, push the pouncing tool all the way into the holder until its rim contacts the pen stopper. The flat side of the tool must face the pen carriage.

3. When the pouncing tool as been properly mounted, tighten the screw.



NOTE: Align flat side of pounce tool as shown

Select Pounce Tool from the Menu

1. Press the function key [F1] through [F4] corresponding to the number of the group whose registered tool you wish to change.
2. Press the CONDITION key to select the tool.
3. Press the F4 key to select the tool you wish to use.
4. Press the RIGHT or LEFT ARROW key to scroll through the tool selection until you select POUNCE to use the pouncing pen.
5. Press the ENTER key to select POUNCE.

Pounce Conditions

To change the setting of a group of conditions, press the function key [F1] to [F4] corresponding to the number of the group you wish to change. For example, press the F2 key to select CONDITION 2.

1. Press the CONDITION key to get into the condition menu.
2. Press the NEXT key to cancel the condition where you are currently set and return to the main menu.

To Change the Pounce Force

1. Press the F1 key to change FORCE.
2. Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 35.
3. Press the F3 key to change QUALITY.
4. Press the F4 key to change OFFSET.
5. Press the ENTER key to register your setting.

To Change the Pounce Speed

1. Press the F2 key to change SPEED.
2. Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 90 and +. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, +.] The + is 126cm/sec speed.
3. Press the F1 key to change FORCE.
4. Press the F3 key to change QUALITY.
5. Press the F4 key to change OFFSET.
6. Press the ENTER key to register your setting.

To Change the Pounce Quality

1. Press the F3 key to change QUALITY.
2. Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality.
3. Press the F1 key to change FORCE.
4. Press the F2 key to change SPEED.
5. Press the F4 key to change OFFSET.
6. Press the ENTER key to register your setting.

To Change the Pounce Offset

1. Press the F4 key to change OFFSET.
2. Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 99.
3. Press the ENTER key to register your setting.

NOTE: For the Pounce Condition, the Cutter Offset refers to the spacing between holes in mm units.

FC4100 Stand Manual

The FC4100 Stand is used to make the unit more portable, free up counter space and make storing your plotter easier.
The Stand is option in the FC4100-75.
The Stand is standard accessory in the FC4100-100 and FC4100-130.

WARNING: Use two people to pick up the plotter.

CAUTION: Do not install the plotter onto the stand with the conveyor rollers or media installed. The unit becomes unstable when heavy loads are added. In extreme cases, the unit may tip over.

CAUTION: Improper assembly of these pieces may cause the unit to become unstable when heavy loads are added. In extreme cases, the unit may tip over.

CAUTION: The longer length leg platform is installed towards the back of the unit.

NOTE: Always keep the wheels in a locked position when operating your plotter.

Contents

1. Left Side Leg
2. Right Side Leg
3. Middle Bar
4. Eight M6 x 16mm Socket Cap Screws
5. M6 Hex Key

Stand Assembly

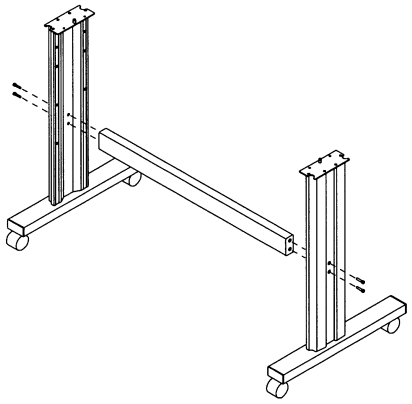
The following information will give you step by step instructions on how to assemble the Stand for the GRAPHTEC FC4100 Cutting Plotter. For the best results, please follow all instructions carefully.

Assembly Area: Assemble the Stand on a secure, flat surface.
Tools: M6 Hex Key

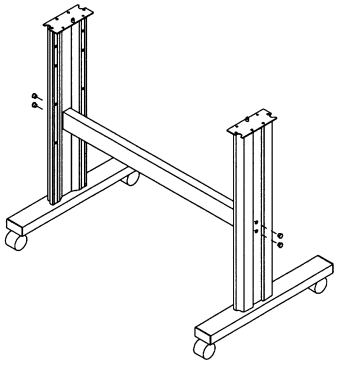
1. Attach Middle Bar to left side of the stand with two M6 x 16mm Socket Cap Screws.

2. Attach Middle Bar to right side of the stand with two M6 x 16mm Socket Cap Screws.

Assembly Tip: If you insert the top screw through the stand frame, you can quickly align the middle bar screw holes to the screw holes in the stand.



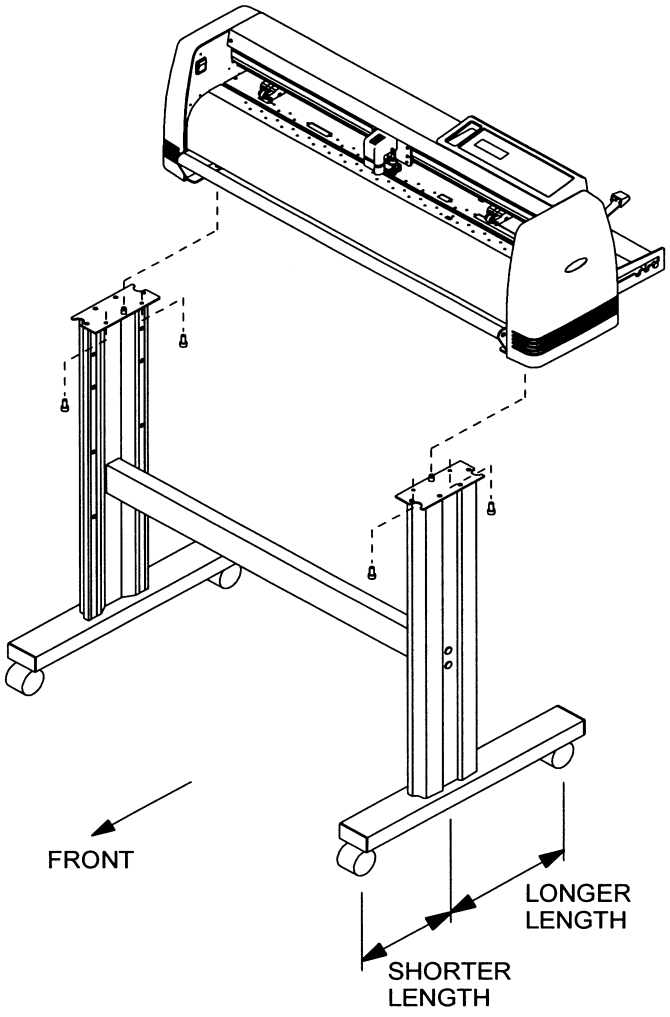
3. Insert Cap Plugs over the holes of the four M6 x 16mm Socket Cap Screws.



4. Lock the Casters.

5. Have two people set the plotter (without the Conveyor Rollers and Media installed) on the Stand assembly using the index pins to align on the left and right top mounting brackets of the stand.

6. Secure unit with four M6 x 16mm Socket Cap Screws.



FC4100 Basket Option

The FC4100 Basket is used to keep your media clean during long length cuts.
The Basket is option in the FC4100-75, FC4100-100 and FC4100-130.

WARNING: Use two people to pick up the plotter.

CAUTION: Remove the plotter from the stand before assembling the basket onto the stand.

CAUTION: Do not install the plotter onto the stand with the conveyor rollers or media installed. The unit becomes unstable when heavy loads are added. In extreme cases, the unit may tip over.

CAUTION: Improper assembly of these pieces may cause the unit to become unstable when heavy loads are added. In extreme cases, the unit may tip over.

CAUTION: The longer length leg platform is installed towards the back of the unit.

NOTE: The basket was designed to be used with Graphtec recommended media only. Other media may be stiffer and will not flow into the basket smoothly.

NOTE: Always keep the wheels in a locked position when operating your plotter.

Contents

1. Four M6 x 16mm Socket Cap Screws
2. Four Hole Plugs
3. Cloth Basket
4. Two Basket Tubes
5. Two Tube Brackets
6. Eight Bushings with an Inner Diameter of .625” (If included)
7. Two Basket Brackets
8. Four Tube Stops
9. M6 Hex Key

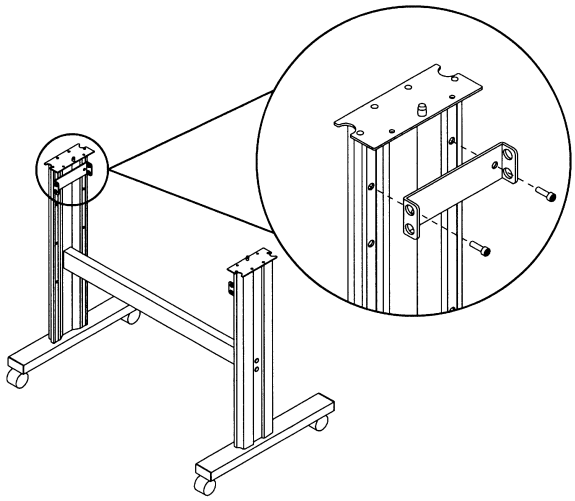
Basket Assembly

The following information will give you step by step instructions on how to assemble the Basket Assembly for the GRAPHTEC FC4100 Cutting Plotter. For the best results, please follow all instructions carefully.

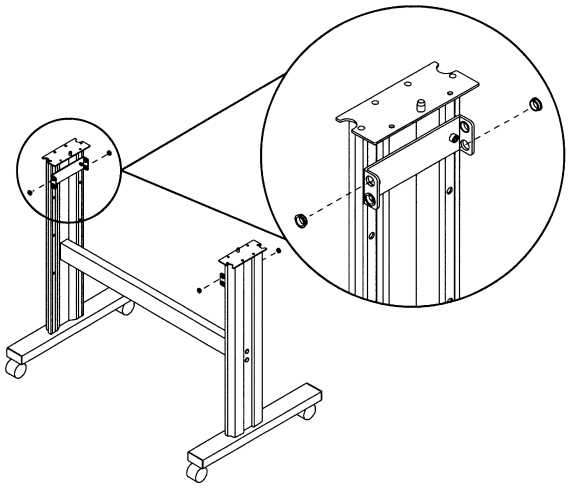
Assembly Area: Assemble the Basket on a secure, flat surface.
Tools: M6 Hex Key
Mallet or Rubber Hammer

1. Attach Tube Bracket to the upper two holes in the left side of the stand with two M6 x 16mm Socket Cap Screws.

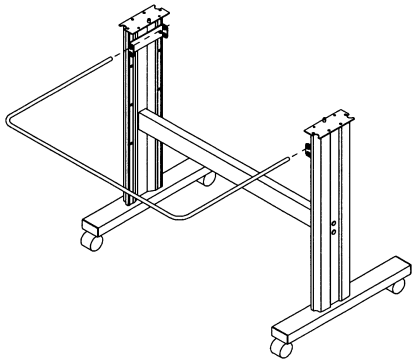
2. Attach Tube Bracket to the upper two holes in the right side of the stand with two M6 x 16mm Socket Cap Screws.



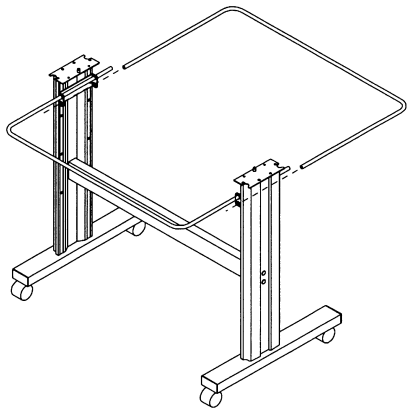
3. Insert eight .625 Diameter Bushings into the front and rear holes of the Tube Bracket.
(Step 3 in necessary only on those units where the bushing are included in the Basket Option.)



4. Install one Basket Tube thru the top two holes of the Tube Brackets front and rear.

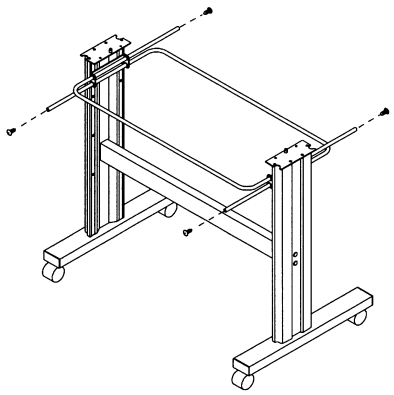


5. Install the remaining Basket Tube thru the bottom two holes of the Tube Brackets rear and front.



6. Push the two Basket Tubes in all the way.

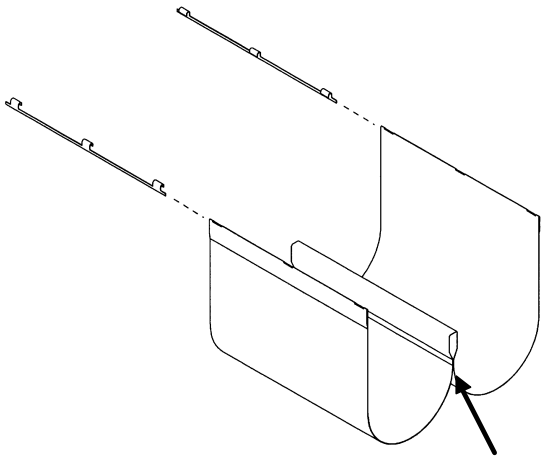
7. Install the Tube Stoppers into the end of the Tubes; use a Mallet or Rubber Hammer if necessary to tap in the stoppers.



NOTE: Do not pull out the tube during operation and dislodge the caps.

8. Insert one Basket Bracket into an end of the Cloth Basket. The hook opening MUST face away from the velcro fasteners. Be sure to insert the bracket all the way thru until the three hooks exit the openings clearly.

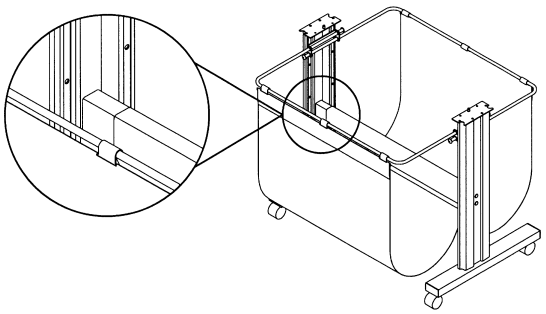
9. Repeat on other end.



10. Slide the Basket thru the Stand. The velcro must face toward the bottom. Position the Basket so that the Middle Bar is between the two sets of velcro

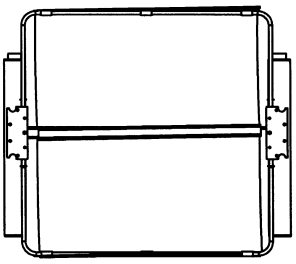
11. Fold the Cloth Basket over the Middle Bar and velcro the Basket in place.

12. Lift the Basket Brackets and mount the hooks to the tube.



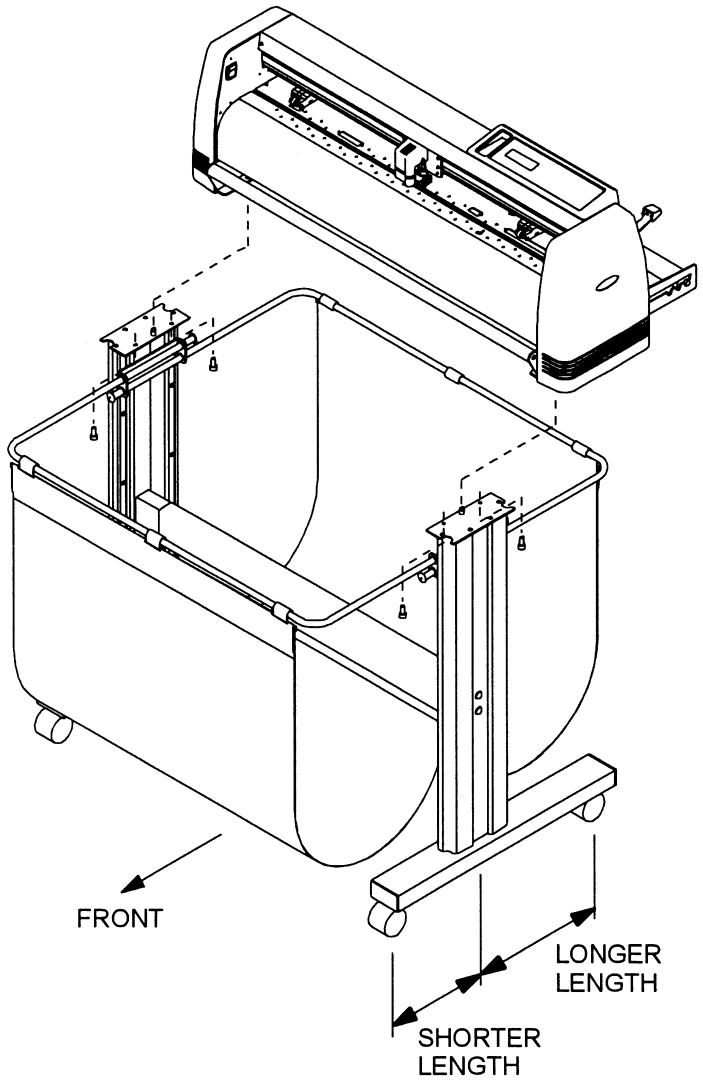
13. Make sure the Basket is aligned and not skewed.

Top View



14. Have two people set the plotter (without the Conveyor Rollers and Media installed) on the stand assembly using the index pins to align on the left and right top mounting brackets of the stand.

15. Secure unit with four M6 screws.



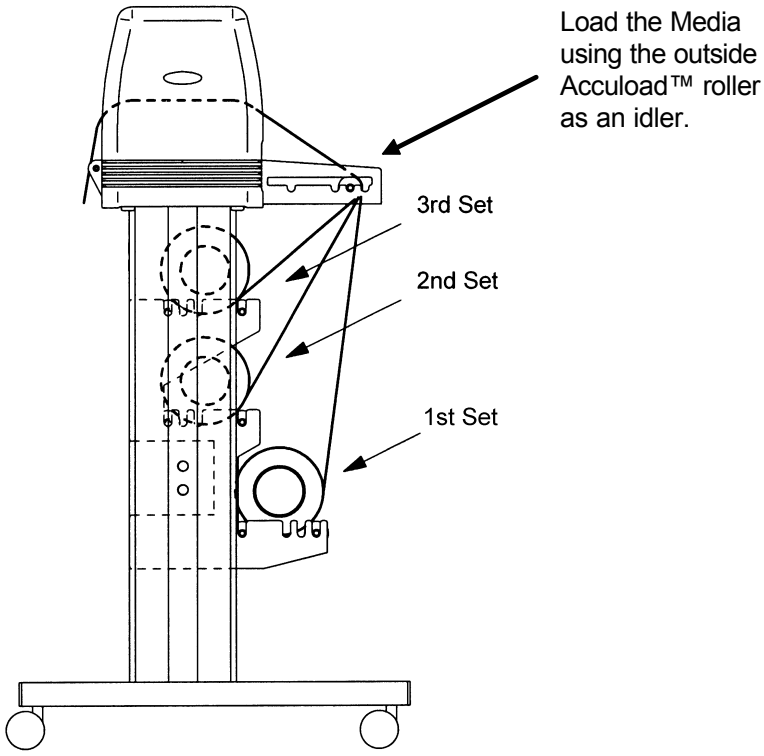
FC4100 Media Roll Holder Option

The FC4100 Media Roll Holder allows multiple roll capabilities and easy storage of your common media colors.
The Media Roll Holder is option in the FC4100-75, FC4100-100 and FC4100-130.

To use the media stored in the Media Roll Holder, you must.

1. First remove the roll of media from your Accuload™ system.
2. Load the Media using the outside Accuload™ roller as an idler.
3. Make sure to feed the media correctly.
4. Make sure to move the roll holders closer together as the rolls become smaller.
5. Make sure to load rolls or logs of media using the top position first, then middle and finally the bottom position.
6. Make sure the diameter of the media is no larger than 6 inches.

CAUTION: Removing the plotter from the stand when the conveyor rollers are loaded will cause the unit to become unstable and tip over.



Contents

1. Two Media Stand Plate
2. Six Conveyor Rollers
3. Twelve M6 x 12mm Socket Cap Screws (Fourteen Screws are in the FC4100-100 and FC4100-130 Option)
4. M6 Hex Key
5. One User Manual
6. Stiffener Rod (Only in the FC4100-100 and FC4100-130 Option)

NOTE: The FC4100-100 and FC4100-130 Media Roll Holders carry a heavier load than the FC4100-75 option, therefore they have a Stiffener Rod with two additional screws to add extra support.

Assemble the Media Holders

The following information will give you step by step instructions on how to assemble the Media Holder Assembly for the GRAPHTEC FC4100 Cutting Plotter. For the best results, please follow all instructions carefully.

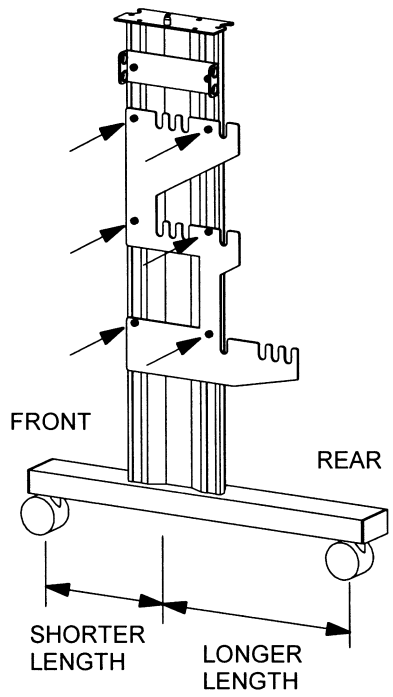
Please note that the Media Holder option for the FC4100-100 and FC4100-130 Cutting Plotter has an additional brace to support the larger media rolls.

NOTE: Keep casters locked during assembly.

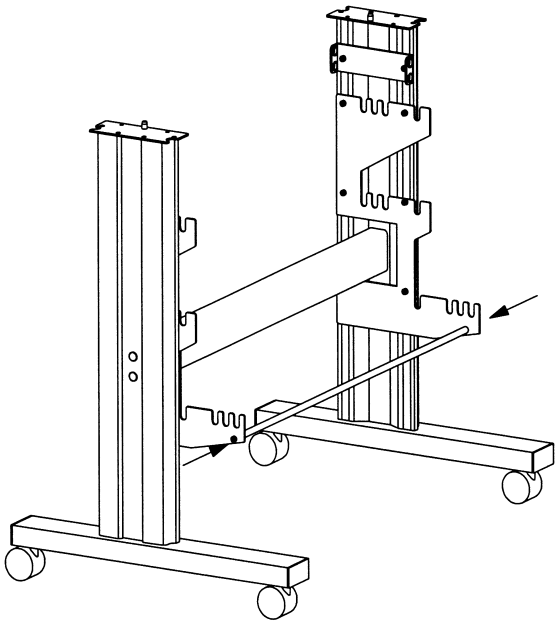
Assembly Area: Assemble the Media Roll Holder on a secure, flat surface.
Tools: M6 Hex Key

1. Assemble the plate to the left side stand (the lower media arm faces the rear) with six M6 x 12mm Socket Cap Screws.

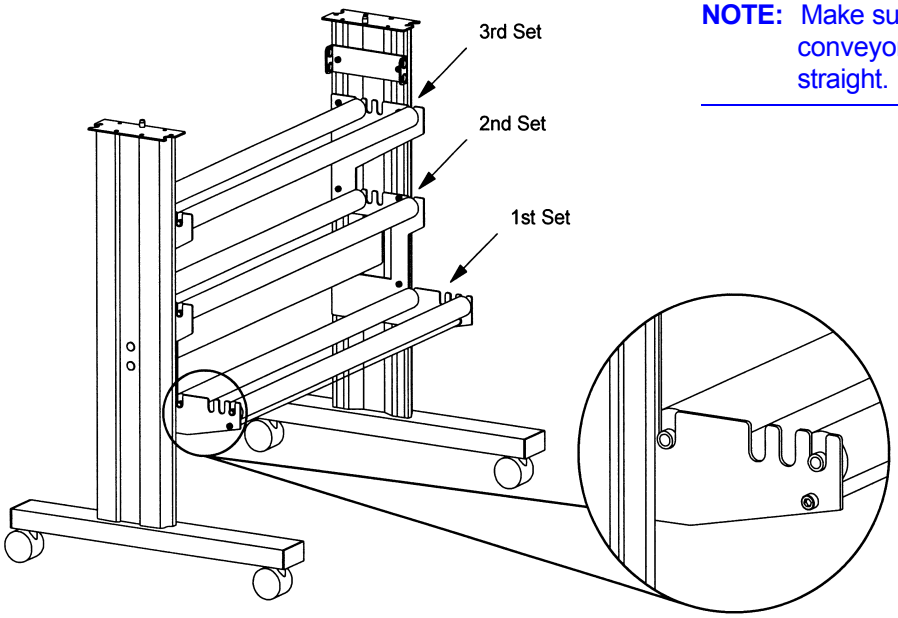
2. Install the other plate on the right side.



3. Attach the Stiffener Rod between the tow Plates with two M6 x 12mm Socket Cap Screws.



4. Insert the lower two conveyor rollers.
5. Insert the middle two conveyor rollers.
6. Insert the top two conveyor rollers.



NOTE: Make sure the conveyor rollers are straight.

Make sure the conveyor roller is seated all the way into the notch.

Appendix

Information to the User

Compliance Information Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Statement of Compliance

Presented to

Graphtec Technology, Inc.

The following model was tested and found to be fully compliant
with FCC/CISPR 22/85 Class A (ANSI C63.4 1992), VCCI Class A (April 1997),
EN55022 Class A (1995) & EN50082-1 (1997)

Plotter/Cutter, FC4100-100, FC4100-75, FC4100-130

Tested at CKC Laboratories, Inc. on January 28, 1999
Report Number**: FA99-015, VC99-019 & CE99-036**

CKC LABORATORIES, INC. Testing the Future

DAR Registration No. DAT-P-051/95-00

Tracy Phillips
Documentation Control Supervisor

Dennis Ward
Director of Laboratories

EC Declaration of Conformity

DECLARATION OF CONFORMITY

We,

Manufacturer's Name :	**Graphtec Technology, Incorporated**
Manufacturer's Address :	**45A Parker** **Irvine, California, USA 92618**
EU Representative:	**Tony Hudson** **Graphtec (GB) Ltd.** Suite 31, Redwither Tower Redwither Business Park Wrexham LL13 9XT, UK

declare under our sole responsibility that the product,

Product Name :	**Cutting Pro**
Model Number :	**FC4100-75, FC4100-100, FC4100-130**
Optional Accessory:	Stand and Media Basket
CE Mark Applied :	1999

to which this declaration relates is in conformity with the following standards or other normative documents,

Safety :	UL1950 EN 60950 / 08.92 EN 60950 A1 / 01.93 EN 60950 A2 / 08.93
EMC :	CISPR22:1993 CLASS A / EN55022:1994 CLASS A VCCI A EN 50082-1:1997

following the provisions of 73/23/EEC, Low Voltage Directive and the 89/336/EEC, 93/68/EEC,EMC Directive.

Danilo Santos
QA-QC Coordinator

Takao Makimura
President / QA-QC Manager

INDEX

A

Accessories C1-1
Accuload System C1-3
Assemble
 Accuload System C1-3
 Basket C9-7
 Cutter Pen SP-3
 Media Roll Holder C9-12
 Pounce C9-2
 Stand C9-4
Adjust
 Push roller positions C3-9, C3-14
 Blade Length C2-6
 Distance C4-36
Advanced Function & Settings C4-1
Area C4-10
Attaching
 Accuload System C1-3
 Basket C9-7
 Cutter Pen SP-3
 Media Roll Holder C9-12
 Pounce C9-2
 Stand C9-4
Auto Pre Feed C4-28
Axis Alignment C4-22

B

Background
 Settings C5-1
 Settings for GP-GL C5-3
 Settings for HP-GL C5-8
Basket Option C9-7
Blade
 CB09UA C2-1
 CB15U C2-1
 CB15U-K30 C2-1
 CB15-10C C2-1
 CB15-05S C2-1
 Handling SP-2
 Length C2-6
Buffer Clear C4-7

C

Caution SP-5, SP-6
Cable Connection S7-10
CB09UA Blade C2-1
CB15U Blade C2-1
CB15U-K30 Blade C2-1
CB15-10C Blade C2-1
CB15-05S Blade C2-1
Centronics Interface C1-5, C7-6
Circle Resolution C5-12
Command
 Error Messages C6-18
 Selecting C7-5
 “W” Command C5-4
 “;” Command C5-3
 “:” Command C5-3
Condition
 Cutter C3-23
 Light Pointer C3-32
 List C6-1
 Pen C3-28
 Pounce C3-30
 Priority C5-4, C5-9
 Setting C3-21
Connecting
 Interface C1-5
 To the Computer C1-5
 To the Power C1-6
Continue C3-19
Control Panel C3-1
Copy C4-3
Cutter
 Conditions C3-23
 Pen Nomenclature C2-2
 Cutters and Holders C2-1
Cutting
 Blades SP-2
 Test C3-25

D

Daily Maintenance SP-8
Data Dump C6-3
Data Sorting C4-18
Declaration of Conformity AP-2
Dimensions C8-5, C8-6, C8-7
Distance Adjust C4-36

E

Error
 Messages and Their Causes C6-14
 Messages in GP-GL C6-18
 Messages in HP-GL C6-20
Expand C4-13
External Dimensions C8-5, C8-6, C8-7

F

Feed
 Changing Speed C3-33
 Function C4-8
 Pre Feed C4-28
Force
 Cutter C3-23

Pen C3-28
Pounce C3-30
Function
Area C4-10
Auto Pre Feed C4-28
Axis Alignment C4-22
Buffer Clear C4-7
Copy C4-3
Command C7-5
Condition List C6-1
Data Dump C6-3
Data Sorting C4-18
Distance Adjust C4-36
Expand C4-13
Feed C4-8
Interface Settings C7-2
Offset Angle C4-33
Offset Force C4-34
Origin C4-2
Origin in HP-GL C4-9
Page Length C4-16
Pen Up/Down C4-6
Rotate C4-17
RS-232C Settings C7-4
Menu C3-4
Mirror C4-20
Scale C4-21
Self Test C6-5
Speed C4-32
Step Pass C4-35
Step Size C7-3
Tangential Emulation C4-30

G

GP-GL
Background Settings C5-3
Command Selecting C7-5
Graphtec Home Page T-1

H

Handling the Cutting Blades SP-2
HP-GL
Background Settings C5-8
Command Selecting C7-5

I

Indicator Lamps C3-1
Initial
Blade Control Position C5-5, C5-9
Menu C3-4
Routine C3-20
Installing
Accuload System C1-3
Basket C9-7
Cutter Pen SP-3
Media Roll Holder C9-12
Pounce C9-2
Stand C9-4
Interface C1-5, C7-2

J

K

Keys C3-1, C3-2

L

Language Selection C3-5, C5-3, C5-8
Length Unit C5-5, C5-10
Light Pointer Conditions C3-32
List Condition C6-1
Loading Media
Roll C3-12
Sheet C3-7

M

Maintenance SP-8
Media
Roll Holder Option C9-12
Roll Media Loading C3-12
Select Type C3-18
Sheet Media Loading C3-7
Size Sensor Control C5-6, C5-11
Menu
Function C3-4
Initial C3-4
Keys C3-2
Tree of Background Setting C5-2
Mirror C4-20
Model No. Response C5-8
More information T-1
Multilanguage Display C3-5

N

Nomenclature (Mainframe) C1-2
Nomenclature (Cutter Pen) C2-2
Notes
Use SP-7
Working Environment SP-6

O

Offset
Angle C4-33
Cutter C3-24
Force C4-34
Pounce C3-31
Options C8-2, C9-1
Origin
Function C4-2
Origin in HP-GL C4-9

Out of the Box C1-1

P

Page Length C4-16
Parallel Interface C1-5, C7-1, C7-6
Pen
 Conditions C3-28
 Up/Down C4-6
 Up/Down for “W” Command C5-4
 Up Movement Control C5-6, C5-10
 Up Speed C4-32
Pinch Roller
 Sensor Control C5-7, C5-11
 Positions C3-9, C3-14
Plotter Pen Conditions C3-28
Plunger
 PHP31-CB15 C2-1, C2-2, C2-5
 PHP32-CB09 C2-1, C2-3, C2-4
 PHP32-CB09N C2-1, C2-2, C2-4
 PHP32-CB15 C2-1, C2-3, C2-4
 PHP32-CB15N C2-1, C2-2, C2-4
Position
 Alarm SP-6, C3-2, C6-17
 Keys C3-2
 Pinch Roller C3-9, C3-14
Pounce
 Conditions C3-30
 Tool Option C9-1
Power C1-6, C1-7
Pre Feed C4-28
Preparing to Cut C3-1
Precautions SP-1

Q

Quality
 Cutter C3-24
 Pen C3-29
 Pounce C3-31

R

Replacing Blades
 PHP31-CB15 C2-5
 PHP32-CB09 C2-4
 PHP32-CB09N C2-4
 PHP32-CB15 C2-4
 PHP32-CB15N C2-4
 The Cutting Blade C2-4
Roll 1 C3-18
Roll 2 C3-18
Roll Media C3-12
Rotate C4-17
RS-232C SP-7, C1-5, C7-1, C7-4, C7-9
Running Cutting Test C3-25

S

Scale C4-21
Select Keys C3-1
Select
 Function Menu C3-4
 Media Type C3-18
 Tool from the Menu C3-21
Serial Interface SP-7, C1-5, C7-1, C7-4, C7-9
Self Test C6-5
Sensor
 Pinch Roller C5-7, C5-11
 Media Size C5-6, C5-11
Setting
 Background C5-1
 Background for GP-GL C5-3
 Conditions C3-21
 Interface Function C7-2
 Multilanguage Display C3-5
Sheet C3-19
Sheet Media C3-7
Sorting C4-18
Special Precautions SP-1
Specifications C8-1
Speed
 Cutter C3-23
 Feed C3-33
 Pen C3-29
 Pen Up C4-32
 Pounce C3-30
Stand C9-4
Step
 Pass C4-35
 Size C7-3
Storing the Plotter SP-8

T

Tangential Emulation C3-22, C4-30
Test
 Cutting C3-25
 Self C6-5
 Test 1 C3-26
 Test 2 C3-26
 Cutting Pro C3-27
Tree
 Function Menu C3-4
 Initial Menu C3-4
 Menu of Background Setting C5-2
Troubleshooting
 Improper Initialization C6-8
 Plotter doesn’t Operate Properly C6-9
 Plotter doesn’t work C6-7
 Poor Cutting Results C6-12
Turn on the Plotter C3-6

U

Unit Length C5-5

V

W

"W" Command C5-4
Withdrawal of the Pen Carriage C3-34
Working Environment SP-6
www.graphteccorp.com T-1
www.graphtecusa.com T-1

X

Y

Z

Others

":" Command Control C5-3
";" Command Control C5-3

The specifications, etc., in this manual are subject to change without notice.

Printed in U.S.A.

Part No. 53801-072T Rev. B

GRAPHTEC TECHNOLOGY, INC.